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THE ARCHAEOLOGY AND HISTORY

OF THE

MCCAIN VALLEY STUDY AREA,

EASTERN SAN DIEGO COUNTY,

CALIFORNIA:

A CLASS II

CULTURAL RESOURCE INVENTORY

Prepared for:

U. S. Department of Interior  
Bureau of Land Management  
Riverside, CA  
Contract No. YA-512-CT9-111

Prepared by:

Archaeological Systems Management, Inc.  
9925 C Businesspark Ave.  
San Diego, CA 92131

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United States Department of the Interior

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Principal Editors:

John R. Cook

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September, 1980

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## FORWARD

This report, authored by a number of scholars under the direction of John R. Cook, of Archaeological Systems Management represents a departure from the normal Class II study. While written for Cultural Resource Management utilization, it is nevertheless a thorough professional report, one which relies heavily on statistics to provide management with a working tool to assess areas which will potentially be impacted by various projects.

Cook and his associates designed a stratified random sample, then conducted the field work in three separate phases. Two of the phases were random while the third was purposive. Nearly three hundred sites were recorded; most of these were associated with water resources (extant, extinct, and seasonal). The ones which were not associated with water were the hundreds of individual and associated agave roasting pits which are a dominant archaeological site type in the area. Areas of extreme site sensitivity are Table Mountain, the Crawford Ranch area, and Vallecitos. No areas of study were found to be devoid of cultural resources. When prehistoric resources were not prevalent, then historic mining and ranching sites were abundant.

As a result of this field inventory, Cook was able to propose that most sites will be located in proximity to water sources, most of the sites will be those representative of the later prehistoric era, and that the McCain Valley study area contains significant manifestations of archaeological complexes not known elsewhere in San Diego County.

The end result of this study was that Cook proposed several research designs and research questions which future researchers should employ when working the area. These parameters deal with temporal relationships in the area, exploitation patterns, settlement strategy, external relationships, and obsidian utilization, among others.

After reading through two drafts of this report and sending the report to twenty-five professional archaeologists for their comment, I agree with one of the commentators who stated "It is one of the best survey reports in the California literature; the explicitness of their approach, finds, and interpretations is commendable."

In reading the report, I feel that you will find that Cook, et. al., are to be congratulated on one of the finest Class II analyses to exist anywhere in the literature of California.

Russell L. Kaldenberg  
Riverside District Archaeologist







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## ABSTRACT

The results of a Class II Cultural Resource Inventory are reported for the McCain Valley Study Area. The Class II study is designed to accommodate the Bureau of Land Management's (BLM) planning and management needs by providing a data base from which objective estimates can be made of the nature and distribution of cultural resources within a defined area. The data base was acquired through implementation of a seven percent multi-stage sample field inventory using an 80-acre transect as the unit of observation. Located in eastern San Diego County, the McCain Valley Study Area is a physiographically transitional region comprised of approximately 98,000 acres of mountain and desert lands administered by BLM. As the study area consists of numerous blocks of noncontiguous BLM lands, it was first subdivided into seven separate sections and then stratified by environmental factors to facilitate sampling. From this, a five percent systematic random sample was drawn in two phases, supplemented by a two percent judgmental survey of unique environmental zones. Historical sites were inventoried purposively, guided by review of literature, records, and documents, and results of informant interviews.

Qualitative and quantitative analysis of the prehistoric sites and features and their environmental associates was used to predict the kind, density, diversity, and potential for sites throughout the entire McCain Valley Study Area. Special studies were performed for rock art and roasting pits, and on limited field collections of obsidian, ceramics, and projectile points. Results of the analysis were synthesized with the existing site record, ethnohistoric and ethnographic data to develop an interpretative framework for understanding the subsistence-settlement pattern in the study area. Theoretical and methodological considerations relevant to future research and potential land use impacts are discussed as the final component.







## ACKNOWLEDGEMENTS

The McCain Valley Class II Cultural Resources Inventory is the result of the coordinated effort of many individuals without whose expertise the study could not have been successfully completed. In the following, project participants are acknowledged for their contributions; authorship for the various report sections is delineated in the Table of Contents.

Andrew Christenson and Scott Fulmer were Co-Principal Investigators for the study and were actively involved in all phases from fieldwork to report preparation. Project management was the responsibility of John Cook. The statistical analyses were performed by Cliff Gates. Sections of the report were written by Scott Fulmer, Terri Jacques, Ken Hedges, Cliff Gates, John Cook, Andrew Christenson, George Harris and Edward Dittmar. The obsidian hydration was performed by Glenn Russell at the University of California, Los Angeles, and Ron May analyzed and classified the ceramic collection.

The field survey was supervised by Andrew Christenson, Michael Perez, and Scott Fulmer, with Tom Banks, Robert Schiowitz, Jackson Underwood, and John Cook serving as crew chiefs. Survey crew members were Debra Dominici, David Schiowitz, William Graham, Margaret Wise, Forrest Nelson, Morgan Fox, Mary Donovan, Robert Case, George Harris, Neysa Carpenter, Robert Healey, Geoff Harley, Steven Joines, and Don Laylander.

Portions of the draft report were edited by George Harris, Stephen Clay, Brian Mooney, and Linda Kozub. Graphics were prepared by Rose Griscom and Randi Hawkins. Tracey Millhouse, Michelle Reed, Dorothy Cabe, Kaye Miller, and Denise Berkey served as typists throughout various phases of the report.

Finally, we would like to acknowledge the assistance and patience of Russell Kaldenberg, Riverside District Archaeologist and Contracting Officer's Authorized Representative of the Bureau of Land Management, and Gail Egolf, former El Centro Area Archaeologist.







## I. INTRODUCTION

This report documents results of a Class II Cultural Resources Inventory of the Bureau of Land Management's McCain Valley Study Area in eastern San Diego County, California. The Bureau of Land Management (BLM) is considering leasing portions of the study area for livestock grazing, which would constitute a potential adverse impact to cultural resources. Under public mandate the BLM is required to identify, evaluate, and protect prehistoric and historic cultural resources on public lands under its control; and to ensure that Bureau-initiated or other authorized actions do not inadvertently harm or destroy non-federal cultural resources. The requirements derive from the Antiquities Act of 1906, the National Historic Preservation Act of 1966 (as amended), the National Environmental Policy Act of 1969 (NEPA), Executive Order 11593, and the Federal Land Policy and Management Act of 1976.

BLM defines cultural resources broadly, to include archaeological and historical sites, features, and places of significance, and places or features of ongoing religious ceremonial or heritage significance to Anglos, Mexicans, and Native Americans.

The goals of a Class II inventory are to execute a representative sample survey of the cultural resources within the study area from which to project site type, frequency, and associated environmental characteristics that may be useful in predicting the resource content of the entire area. Specific goals outlined by BLM included:

1. Recognition or elaboration of patterns of past human use and occupation.
2. Determination of the cultural resource potential of the study area.
3. Prediction of zones of greater or lesser activity by past human populations.
4. Identification and assessment of the environmental and/or cultural variables, or combination of variables, that form the most accurate predictors of cultural resource sites.
5. Development of projections of expected density distribution and diversity of cultural resources.
6. Discovery of the range of cultural resource variability within the study area.
7. Development of a research design for the study areas to provide direction for future research and a basis



for formulating and evaluating mitigation plans.

To meet these goals both random and purposive samples of the area were conducted for archaeological and historical sites within BLM lands. Extensive qualitative and quantitative analysis of the survey results provided estimates of cultural traditions present, site type variability, areal density, and the degree to which major environmental factors such as land-form, vegetation, or drainage morphology characterize site type distributions. These results were reviewed against existing site data and archaeological and ethnographic studies to form a regional interpretive framework and set priorities for future work.

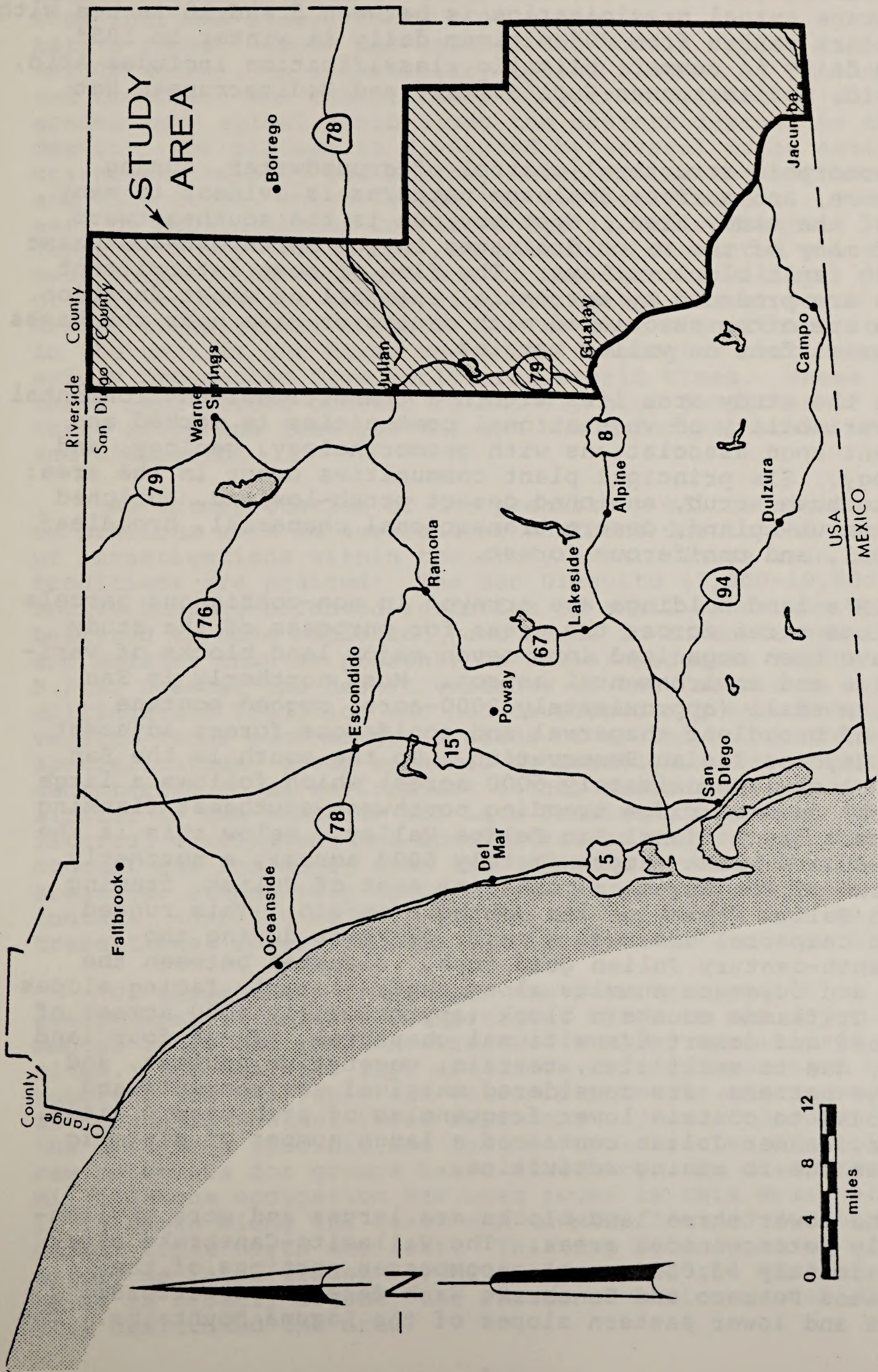
For the convenience of the reader, a synopsis of the major elements are presented below to serve as a guide to the study's contents and conclusions. These elements have been further broken down into four major categories which include: Orientation to the Area, Orientation to Research Methods, Study Results and Recommendations. These categories correspond to the major sections of the report which include: Environmental Setting, Research-Prehistory, Research-History and Regional Research Design.

#### Orientation to the Area

Bureau of Land Management lands administered in San Diego County are organized into three environmental study areas: Inland Valley, Otay-Hauser, and McCain Valley. These areas encompass the major physiographic zones found in the county: coastal terraces, inland valleys, mountains, and desert. Located in the eastern portion of the county, along the mountain-desert transitional zone, the McCain Valley Study Area consists of several hundred thousand acres extending from just north of the Riverside-San Diego County line to the International Border and situated between the Anza Borrego Desert State Park on the east, and the Cleveland National Forest on the west.

The study area lies within two geomorphic provinces: the Peninsular Range and the Salton Trough. The dominant relief elements associated with these provinces include the northwest-southeast trending Laguna and Cuyamaca mountain ranges, and adjacent desert valleys that are a southwestern extension of the Colorado Desert on the western periphery of the Salton Trough. The variety of rocks, minerals and soils present in the study area evidence the complex combination of geologic processes which has operated in the region. The most abundant lithologic types exposed in the area are plutonic rocks derived from the intrusion of the Southern California Batholith, while restricted exposures of volcanic rocks occur in the southern portion around Table Mountain. Soils derived from these parent materials range from fine to coarse sands and loams.





Location of Study Area in San Diego County

FIGURE 1



The east-west altitudinal gradient imposed by the Peninsular Range creates a rain shadow over much of the area. The average annual precipitation is between 5 and 10 inches with temperature ranges from 30° minimum daily in winter to 105° maximum daily in summer; climatic classification includes Arid, Semi-Arid, Mediterranean Cool Summer, and Mediterranean Hot Summer.

Geomorphic structural control of groundwater, spring occurrence, and surface drainage patterns is evident in many parts of the study area. Most obvious is the southeastward flow of many of the major drainages in the northwest-southeast trending fault block valleys. The flow of most intermittent streams are produced by torrential rainfall of short duration. Springs are often associated with faults or rise near the bases of alluvial fans on valley margins.

As the study area lies within a transitional environmental zone, variability of vegetational communities is marked and dependent upon associations with geomorphology, geology, and hydrology. Six principal plant communities occur in the area: creosote bush scrub, enriched desert scrub-lowland, enriched desert scrub-upland, desert transitional chaparral, broadleaf chaparral, and coniferous forest.

BLM's land holdings are arrayed in non-contiguous parcels of various sizes across the area; for purposes of the study they have been organized into seven major land blocks of variable size and environmental aspect. Most northerly is San Ysidro, a small (approximately 2000-acre) rugged montane parcel of broadleaf chaparral and coniferous forest adjacent to Los Coyotes Indian Reservation. To the south is the San Felipe block (approximately 5000 acres) which follows a large chaparral-covered ridge trending northwest-southeast flanking the desert transitional San Felipe Valley. Below this is the Banner-Julian block (approximately 6000 acres), a northerly extension of the Cuyamaca mountains east of Julian, framing the San Felipe valley on its southern margin. This rugged montane chaparral area was a major prospect during the nineteenth-century Julian gold rush. Situated between the Laguna and Cuyamaca summits along their easterly facing slopes is the Oriflamme mountain block (approximately 4000 acres) of broadleaf and desert transitional chaparral. These four land blocks, due to small size, terrain, vegetative habitat, and drainage pattern, are considered marginal environments and were found to contain lower frequencies of prehistoric sites. However, Banner-Julian contained a large number of historic features due to mining activities.

The lower three land blocks are larger and more environmentally heterogeneous areas. The Vallecito-Canebrake block (approximately 33,000 acres) encompasses portions of the Vallecitos Potrero and Canebrake Wash desert transitional valleys and lower eastern slopes of the Laguna Mountains. The



broad desert valleys are alluvial with braided, seasonally active stream courses at their western extents. The surrounding area includes steep, rocky side slopes with sparse scrub vegetative cover. South and east is the McCain Valley (approximately 40,000 acres), an intermediary upland plateau of rolling hills and broadleaf and transitional chaparral vegetation which grades into upland scrub along the eastern descent to the desert. The plateau is dissected by several major active drainages, notably Bow Willow, which drains the northern portion and Tule Creek, which drains the southerly aspect. South and east of McCain across Carrizo Gorge is Table Mountain (approximately 7000 acres), an anomalous dissected volcanic mesa forming the northern end of the Jacumba Valley. The primary vegetative communities are upland desert scrub and desert transitional chaparral. The most significant resource in the unit is the mixed volcanic lithologies that have been avidly prospected from early prehistoric times. These lower three land blocks contain relatively high densities of prehistoric sites and features and are the principal areas of analysis and discussion.

An interpretation of the prehistory of the region is based on previous work in surrounding environs due to the paucity of investigations within the study area. Three main cultural traditions are posited: The San Dieguito (7,000-10,000 B.P.), mobile hunting-oriented societies of small bands who are believed to have exploited game herds in an environment cooler and moister than at present; La Jolla/Amargosan (7,000-2,000 B.P.), coastal and desert variants of the California Millingstone Tradition who had developed a greater emphasis on vegetal foods such as grass seeds or acorns and increasing specialization, group economic cooperation, and seasonal sedentarism in an environment either drier and warmer or similar to the present; and Late Prehistoric groups, who from internal development and specialization and/or cultural contact and influence from the Colorado River or Central Valley areas had extensively occupied the study area at historic contact, adapting to both the Peninsular Range summits and transitional desert valleys and their characteristic biota.

Of these three traditions the Late Prehistoric is prevalent everywhere, with large occupational sites in all major environmental zones and complex arrays of smaller specialized activity sites. San Dieguito type artifacts and features have been reported for the Table and Volcanic mountain areas; however it is debatable whether these represent a general occupation of the area or a specific and limited exploitation of geologic raw materials for groups based elsewhere. No clear record of Millingstone occupation has been found in this area, although it is known along the coast and in more limited fashion in desert areas north and east. This may be a function of sample error, as later groups may have reoccupied the earlier sites, or as is broadly argued, the result of environmental changes that desiccated the area.



The ethnohistoric and historic periods are of course documented in literature and records. Ethnographic reports indicate that at the time of contact Diegueno/Kumeyaay groups practiced a regular seasonal round from the Laguna and Cuyamaca summits to the transitional desert valleys of San Felipe, Vallecitos, Canebrake Wash and beyond. Descriptions for the McCain Valley/Jacumba areas are unfortunately lacking; however, it is worth emphasizing that the study area crosscuts in part the known territory of specific lineages, at least during the late phases of occupation. Historic development and impact proceeded slowly; early penetration into the area was made in search of transportation routes from the coast to the Colorado River. The major impacts were the introduction of ranching and the discovery of gold near Julian in 1869; but in general the area grew slowly with limited sheep and cattle ranching as the primary focus. The regional historic sequence is divided into three ethnic periods of influence: Hispanic (1769-1822), Mexican (1822-1848) and Anglo (1848 to the present); Native Americans were increasingly circumscribed by their developments until reservations were established in the late nineteenth and early twentieth centuries.

#### Orientation to Research Methods

As explained above, the study addressed archaeological and historical sites and features, both as to their diversity and their distribution within the study area. To meet the study goals, a stratified systematic sample of each area using quadrants of fixed size was implemented for analysis of archaeological sites. This procedure was followed to ensure that a representative sample of each area and the environmental diversity within was taken, that different zones or areas were given relatively equal (proportional) coverage, and to facilitate quantitative, statistical analysis of the results. The sampling was conducted in successive phases so that adjustments could be made if found advantageous. Historic sites were primarily inventoried through purposive coverage of specific areas identified by records, literature or informants' accounts. Historic sites encountered in the random sample were also recorded.

The random sample was drawn from each of the seven areas by first stratifying each area as to basic landform (mountain, mountain valley, desert valley, and canyon), computing the area of each stratum within each landblock and deriving the number of quadrants (transects) to be drawn from the relative percentage of area each region/stratum represented. The size and shape of the transects were predetermined at 1/4 by 1/2 mile 80-acre rectangles to allow cadastral (township/range: section) orientation, to facilitate efficient field coverage and to reduce the level of environmental diversity within each sample unit. The first stage sample was set at 50% of the total to be drawn, or 44 transects (approximately 3500 acres); and was selected by consecutively numbering quarter sections in



each landblock, selecting a starting point at random, and drawing quarter sections at systematic intervals until the number of transects needed was reached. The orientation of the transect within each quarter section was also randomly selected from one of four possible orientations.

After the initial sample had been completed, it was found that transects in the mountain stratum, especially in the four northern units, were often impossible to survey and had a low yield of sites. It was decided to adjust the sample design to allow judgmental selection of transects in the four northern areas and to increase the proportion of transects in the mountain valley and desert valley strata, where site frequency and diversity were higher. A second random sample of 30 transects was drawn for the lower three landblocks, followed by a third stage judgmental sample of 22 transects. In all 90 transects were completed or 7200 acres of an estimated 98,000 total.

The field inventories were conducted during May and June of 1979. Transect coverage was accomplished by crews of four in two sweeps at 50-meter intervals. A total of 230 man days were expended at an average coverage level of 35 acres per man day. Difficulties encountered were caused by terrain and brush, heat, and the logistical problems of translating map locations to physiographic reality, and access into areas. Specific descriptions of environmental characteristics, cultural features and causes of deterioration or destruction to sites were recorded in the field. Limited collections of obsidian, ceramics and diagnostic artifacts were taken for more detailed description and analysis. Concurrently, the purposive historical inventory and a purposive search and inventory for rock art sites was completed.

The results of the sample survey were documented in record forms submitted to BLM and transformed, along with ancillary environmental data, into a format for computer aided summary and analysis. Two main data files were developed: a transect file containing environmental characteristics and the number and types of sites recorded and site files with specific attribute descriptions for each site and environmental characteristics associated. A third file of site data for previously recorded sites was developed, but only contains site attribute descriptions and is intended for less formal comparative use.

The sample is designed, in a strict sense, only to provide density estimates for the four landform strata within each region. In actual practice it may be used to evaluate the relationships of sites to other features of the environment, and to define the variability in site content and structure across the region. These analyses are to varying degrees weakened, as the sample was not specifically designed to address them, but they are of sufficient strength to approximate



relationships and suggest new avenues of approach. Areal quadrant (transect) sampling provides estimates of the frequency and variety of sites within and between defined zones but provides less information on the interrelationship of sites. It may be demonstrated that there are more roasting pits in the mountains of one valley system versus another, but can only approximate the interrelationship of villages to roasting pits by testing whether the overall number of villages increases proportionally. Block regional sampling or sampling of sites rather than areas is also needed. Here two modes of analysis are used complementarily to expand the range of the study: transect or areal analysis, which controls site distributions by the environmental characteristics of the sample, is used for estimating site densities and can also be used to analyze conditions under which an absence of sites is noted; and site-specific analysis which controls environmental characteristics by the frequency of sites recorded, and is used to assess cultural variability within and between site types.

For analysis, the first goal was to order the sites into consistent categories on the basis of cultural tradition (temporal variability) and content and structure (formal variability). Descriptive attribute analysis was used to facilitate the reorganization of the categories by other analysts. As was discussed above, there is no single set classification for sites, and whichever one is used will change the results of comparing one area to another markedly. As requested by the agency the Desert Planning Studies Scheme was relied upon, but it should be recognized that imposing a standard that has not been demonstrated relevant in a specific area is hypothetical and potentially counter-productive. The second goal was to produce technical density estimates for region and strata for the various site types encountered. The third goal was to search for various environmental/site type relationships that may effectively predict the density or distribution of sites across the region. Most of the analytic effort was spent toward this end. Various potential stratifications were applied to the area such as slope, landform, geology, hydrology, and vegetation; relationships between all sites, particular site types, and various clusterings of different site types were tested for. A far greater number of tests were applied than are reported in this document, as several thousand pages of test output were generated.

The results were compared with the previously recorded site data, specific ethnographic accounts for the region and archaeological theory concerning the behavior of hunters and gatherers to provide an interpretive summary. This section particularly addresses the economic strategies and settlement or activity location patterns reflected in the results, and summarizes theoretical tools relevant to further study. A summary of regional research problems and changes to current



practices to more adequately discuss these issues is also presented. It should be realized that most of the topics raised in the analysis and results need to be further developed and could easily form the basis of a research orientation for future projects. The recommendations presented there are broader in scope and are presented in addition to the problems raised in the analysis.

Finally, certain ancillary studies were undertaken that necessitated separate treatment. Diagnostic artifact types were collected on a limited scale to allow more detailed description and analysis of the range of types within the area. These included projectile points and ceramic types. Samples of obsidian found at sites were collected for hydration analysis, a dating method which has promise for more closely defining temporal/cultural sequences in the area. A separate inventory and analysis of rock art (petroglyph and pictograph) is also presented. The systematic inventory recorded only one rock art site for the sample. While this is probably representative of their relative frequency in relation to other site types or density in terms of overall area, this type of site holds considerable interest for a broad spectrum of individuals and researchers, and as a group are rapidly being destroyed by physical processes of decay and vandalism.

### Study Results

Two hundred fifty-four (254) prehistoric sites were discovered during the survey. The most represented site type is the roasting pit (112 sites), followed by isolated finds (41), temporary camps (36), sherd/lithic scatters (35), milling stations (19), rock shelters/alignments (8), and pictograph/cupule sites (3). Within these groupings, temporary camps may be evenly divided between large habitation sites, camps, and extensive milling stations, while a few lithic scatters and milling stations may actually represent campsites. Some ambiguity is unavoidable given that this is survey data and that the condition of the sites is deteriorated. All sites are assumed to date from the ceramic phase of the Late Prehistoric. This is not to say there may not be a preceramic phase of occupation to the area, simply that it could not be demonstrated in the sample results. The inferred functional characteristics of the site distribution supports this generalization in that two-thirds of the total sites had artifacts or features related to vegetal food extraction or processing (milling, roasting pits). Approximately 15% are considered habitational. Roasting pits are the most numerous class of site (45%) and along with isolates or other ambiguous categories leave only 40% of the sample total for interpretive analysis, a clearly limited base.

Of the four northern areas, archaeological sites were only recorded in the San Felipe landblock and were absent in the other three. However, historic features were noted in



Oriflamme and especially Banner/Julian which has a high density of mining-related sites and features. These landblocks are small, had fewer transects, and significantly reduced ground surface visibility due to brush.

For the three largest landblocks, site densities of 20 to 50 sites per square mile were estimated. The highest density, but also most variable, was the mountain stratum in Vallecitos-Canebrake ( $52/\text{mile}^2$ ) due principally to the prolific number of roasting pits. Table Mountain was next highest ( $41/\text{mile}^2$ ) but probably has a greater density overall as the variability between transects was lower. McCain Valley had an average density of  $20/\text{mile}^2$ , which was consistent across different strata and is also consistent with the desert valley stratum in Vallecitos-Canebrake. Isolating on site type 2, which are most representative of habitation sites, we find a regional average of  $2.5/\text{mile}^2$ , with Table Mountain at  $6.8/\text{mile}^2$ . It is important to understand that these are point estimates from a relatively small sample and should be qualified by interval estimates which are presented in the technical analysis. Formal statistical tests of differences between region and stratum densities demonstrated no significant differences in density.

Other environmental factors were tested against the sample distribution. Average slope of the transect and the area surrounding the site was tested; but the expected result, that sites, especially habitation sites, are more frequent in zones of low slope values, could not be demonstrated. This is primarily the result of two characteristics of the sample: the number of roasting pits on steep sideslopes, and the number of camps in small strategic flats, usually along stream courses, in mountainous areas. Qualitative landform analysis of 40-acre and one-mile areas around sites also lacked significant patterning, suggesting that small flats under 40 acres in size were regularly used for site locations. Analysis of the relative frequency of sites in transects wholly within a stratum vs. crosscutting two strata (i.e. pure mountain vs. part mountain, part mountain valley) was suggestive of greater frequencies of sites around the margins of major landform changes.

Underlying geologic formations and site distributions were tested but due to problems in scaling and uneven areal distribution no significant results emerged. A strong impression of relationship between reported early San Dieguito and felsitic exposures may be noted, however. More detailed field recording of bedrock outcrop type and frequency and metavolcanic exposures may be recommended for future analysis.

Overall vegetative community and field observations of specific genera thought to be economically significant were evaluated. For communities chaparral had a significantly lower frequency of sites and upland desert scrub a higher frequency.



This is probably due to the negative survey results in the northern units, and the frequency of roasting pits recorded on mountain slopes framing the desert valleys. Analysis of specific genera resulted only in the obvious: roasting pits are highly associated with agave. Prunus sp. may be to some extent associated with habitation sites.

The distance of springs and stream features ranked by the Strahler method to various classes of sites proved the most effective predictive factor for site type distributions. Distance to the nearest Rank II or higher stream or spring segregated the sites into internally consistent groups. Large habitation sites and all sites with midden were situated within 100 meters, milling stations and/or small camps averaged 3-400 meters and lithic or lithic/ceramic sites averaged out at a kilometer distant. Analysis of the relationships of sites to Rank I streams was not effective; interestingly site distributions and observed surface water was only weakly associated and only for large habitation sites. Hence the relationship to Rank II streams may have something to do with plant or animal habitats rather than just water availability. That large streams create access routes across rugged terrain may also be contributing to the relationship.

As a final test for locational factors, a discriminant analysis (SPSS version) was performed on the combined environmental variables mentioned, as a test of their individual contributions to variability in the overall regional site distributions. Although numerous tests were run on different combinations and weightings, as anticipated, hydrology was the most significant factor associated with distribution. Hydrology thus appears to have the greatest power in a predictive sense.

The summary conclusion from the analysis is that the distribution of all sites is not significantly variable within the study area. Table Mountain may exhibit a higher density due to the presence of an important geologic resource that may have been quarried over the past ten thousand years. No other feature within the study area can be expected to have had this potential importance for so long a time. The rugged chaparral mountain areas of the northern four landblocks may exhibit a lower density of prehistoric sites, but not of cultural sites, due to the early mining focus in the area. The sample base for these conclusions is small and the scaling of both site type variability and environmental zones or features is very descriptive and generalized. The analysis should be considered only as an initial evaluation from which to evaluate techniques and design new experimental methods. While it could not be demonstrated formally from this sample or analysis, such factors as slope/landform or vegetation and especially the spatial interrelationships between different classes of sites seem to have significant potential for contribution to a predictive model.



A purposive survey for historical sites recorded 141 locations of interest, some of which, while relatively recent, may in the future be representative of developments in the area. Fifty-nine (59) sites were related to mining activities, forty-one (41) to ranching, twenty-four (24) to retirement and recreation, and seventeen (17) to transportation. Major events or themes associated with these sites include transportation (Southern Emigrant trail, Sonora trail, Overland Stage route, San Diego Arizona Eastern Railway); mining (Julian Gold Rush); ranching (Mexican Land Grants, Homestead Act, Taylor Grazing Act); and later recreational development and land use.

The San Ysidro landblock was influenced by the Old Overland stage route, ranching from the Mexican period and the gold rush, homesteading, and twentieth century mining. Of these only one early homestead was recorded; the remaining features were twentieth century mining and homestead sites.

Essentially no historic sites were noted within the San Felipe landblock; however, several significant sites including San Felipe stage station and San Felipe Rancho house are adjacent to the study area in San Felipe Valley.

Banner/Julian landblock was heavily influenced by mining during the Julian gold rush and subsequent mining between 1870 and 1930. Most of the sites recorded were mines and/or ruins associated with their use. A few ranch sites from this time were also noted. While the sites do not often contain large amounts of material or debris, the area is quite significant historically.

The Oriflamme and Vallecitos-Canebrake landblocks were influenced by transportation and ranching. The transportation and exploration route pioneered by Fages in 1772 went through this area, as well as the Mormon Battalion, Birch and Butterfield stage lines, Jackass mail route, Confederate Army provocateurs, the Army of the Pacific, and various explorers and settlers. The Vallecitos Stage Station is a significant resource of this focus. Cattle grazing and ranching were also important, by families such as the Masons, Campbells and Crawfords. Some limited mining and oil exploration was also attempted. In later periods homesteading and recreation supplanted ranching as the primary focus.

The McCain Valley landblock has been primarily a ranching area. Settled by George McCain in 1868, his descendants are still actively ranching the area. Most features noted were post-1930, except for a few windmills, corrals, barns, the D. McCain ranch house, and some ranch structures in Lark canyon. Walker Canyon at the southeastern edge of the landblock contains early structures associated with settlement and construction of the San Diego Arizona Eastern Railway near Dubber Spur.



The Table Mountain landblock follows its prehistoric focus into the historic period, as an area of active mining. A major period of activity at the turn of the century emphasized semi-precious gems. Transportation was also of importance as a basic route from San Diego to Yuma passed through nearby Walker Canyon and Jacumba in one of its various forms from 1785 on. No sites prior to 1920 were identified during the survey, however.

### Recommendations

As a final component of the results, a regional research design is presented. This discussion is intended to highlight major theoretical issues that are relevant to the area and that may guide future research efforts or mitigation projects. As the bulk of the analysis and discussion is oriented around archaeological concerns, and as these are most often dealt with in cultural resource management projects the discussion is focused upon archaeology. The recommendations made address organizational, theoretical, and methodological needs.

Organizational recommendations are made to stimulate and maximize the value of information collected. It is recommended that projects demonstrate relevance to regional research needs or issues and be designed in consideration of the total population of resources found in the area. Future research will be more effectively designed and executed if previous results are compiled systematically, recorded in as consistent a format as possible, and readily accessible. The Class I and Class II studies have organized a great deal of information but should be updated and revised in relation to new data as it becomes available, if their potential value is to be realized. This would be facilitated by an annual review and update of cultural resources known or estimated in the study area, description and analysis of collections held by other institutions or private individuals and integration of data collected by other agencies (i.e. Cleveland National Forest, Anza Borrego Desert and Cuyamaca State Parks) that are culturally and environmentally relevant to BLM's holdings.

Theoretical recommendations emphasize broader structures that will serve as underlying thematic issues of interest. For early prehistory, the effects of postulated climatic changes upon economic adaptation have been emphasized in the past; but have not been systematically developed or tested. Paleo-climatic reconstruction will be of major ongoing interest. An alternative to environmental changes as an explanation for cultural change has been diffusion and in-migration from other areas. These competing arguments also extend in part to the Late Prehistoric period. The major theoretical recommendation forwarded for the area is that emphasis be shifted to viewing archaeological cultures as systems of adaptation and tracing their evolutionary development within static or changing



environments, rather than pursuing more detailed sketches of normative lifeways through time. That cultural diffusion, population migration, or major environmental events caused changes in the culture-historical sequence can only be accepted after the counter-hypothesis of change through internal growth and adaptation has been evaluated, and the potential responses of a group to diffusion or drying of climate can be modeled and tested.

For example, when ceramic technology appeared in the area and possible sources for either its introduction or being borrowed from outside areas is a necessary and important question; but why ceramics were adopted and what effects they had on economics, cooperation, or demographics are more basic questions to the explanation of behavior. The first question has not been answered in the San Diego-Imperial regions, and may be considered a viable research option; however, the underlying interest is in the second set of questions that have also not been answered, and are the thrust of the recommendation made. Specific topics of interest include the effects of Lake Cahuilla upon the economic systems and population densities of Late Prehistoric groups in the study area; an explanation for the apparent occupational hiatus during the Millingstone Tradition; the effects of environmental change at the end of the San Dieguito Tradition, the development of economic reliance upon storageable vegetal foods such as agave and oak acorns, or the extent to which ethnographic and ethnohistorically recorded descriptions of social and economic organization reflect the Late Prehistoric Tradition as a whole.

Methodological recommendations are made to improve the quality and expand the utility of samples recovered and sequences or classifications of materials resulting. As regional samples are necessary to develop artifactual type variability studies, more refined models or classifications of sites and their behavioral implications, or areal chronological sequences, it is urged that some representative samples be collected at data recovery projects that can be used to address regional issues, whether these are the chosen focus of study or not. It is also urged that more quantitative analyses of results be used to promote more complete and thorough selection, description, and classification of materials. Specific needs include representative samples of ceramics, obsidian for hydration dating, or relative percentages of various flaked lithic artifacts at different types of sites. This is in recognition that both the relative frequency of type variability within sites and between sites across the region will be needed to refine archaeological sequences and develop a more detailed cultural history for the region.



## II. PROJECT SETTING: NATURAL ENVIRONMENT

The McCain Valley Study Area is divided, as discussed in the Introduction, into seven sections: San Ysidro Mountains, San Felipe Hills, Banner/Julian, Oriflamme, Vallecito/Canebrake, McCain Valley, and Table Mountain (Figure 2). This part of the report discusses, first, the environmental characteristics--physiography, hydrology, vegetation--in the general study area, and then discusses these characteristics for each of the seven sections.

### 2.1 PHYSICAL CHARACTERISTICS OF THE MCCAIN VALLEY STUDY AREA

#### Physiography

The McCain Valley Study Area lies within two geomorphic provinces: the Peninsular Range and the Salton Trough. The dominant relief elements associated with these provinces include the northwest-southeast trending mountain ranges, and the southwestern extension of the Colorado Desert situated on the western periphery of the Salton Trough (McArthur 1976). Both provinces reflect complex structural and geomorphic processes which have operated throughout Tertiary time. The Peninsular Ranges contain a variety of igneous rocks associated with the intrusion of the Southern California Batholith during the Mesozoic. Subsequent tectonic activity and exposure by erosion have produced the northwest-southeast oriented complex of westward-tilting fault blocks of the Peninsular Ranges. The eastern portion of the ranges falls sharply, in steep ravines and scarps, toward the Salton Trough, a down-faulted block (graben) resulting from tectonic activity since Miocene time (Larson, Menard, and Smith 1968). Associated with this tectonic activity has been the progressive development of three major northwest-southeast trending transform faults that cross the region: the Elsinore, San Jacinto, and San Andreas fault zones (Morton 1977).

Extensive Post-Cretaceous erosion of crystalline units has resulted in deposition of substantial amounts of sediment in the Imperial Basin, the Elsinore Trough and other local interior catchment areas. Limited Miocene volcanism occurred in some areas of the Peninsular Range, for example, Table Mountain.

Petrology. The variety of rocks, minerals, and soils in the McCain Valley Study Area indicate the complex combination of geologic processes which have operated in the region. Descriptions of mapped geologic units and large scale structural features are from the Santa Ana (1965) and San Diego-El Centro (1962) Sheets (Geologic Map of California, Division of Mines and Geology, Department of Conservation, State of California).



The most abundant lithologic types exposed in this study area are Mesozoic Plutonic rocks--granite, granodiorite, quartz diorite (tonalite), diorite, and gabbro--of the Southern California Batholith. Remnants of older roof rock occur and include metamorphic rocks. The most common lithologies are various schists, quartzites, and gneisses. Some Miocene volcanic rocks occur in the study area on Table Mountain and in the northern area of the Jacumba Mountains. These volcanic units consist of andesitic lava, breccia, and tuff.

Sedimentary units in the area range from Miocene to recent in age and are predominantly alluvial fan and floodplain deposits. Processes in these environments have produced a wide variety of gradational sedimentary types including granite wash and arkose, conglomerates, sandstones, siltstones, claystones, and sedimentary breccia.

Soils. Soil types in the McCain Valley Study Area reflect variations in the interaction of the major soil-forming factors: parent material, relief, climate, living organisms, and time (Bowman 1973). Over the mountainous portions of the area, steep topography, extensive rock outcrops, weathering, and erosion have contributed to the development of shallow, excessively-drained to well-drained loamy coarse sands and sandy loams of the Bancas, Kitchen Creek, La Posta, and Tollhouse associations. These soils are derived from weathered granitic rocks, principally granodiorites and quartz diorites. Holland and Sheephead soils have fine sandy loam surface layers, are developed on steep slopes, and are derived from metamorphic rocks, predominantly micaceous schists.

In intermontane valleys and on valley margins, well-drained coarse sandy loams and loamy coarse sands of the Mottsville-Calpine association occur on alluvial fans on 2 to 15 percent slopes.

In the desert areas, gently sloping alluvial fans and plains lie in the rain shadow to the east of the mountains. In these environments well-drained to excessively-drained sandy loams, silt loams, loamy coarse sands, and gravelly sands of the Mecca-Indio and Rositas-Carrizo associations have developed. These soils are derived from mixed parent materials exposed in the adjacent mountains, principally granitic igneous rocks and micaceous schists and gneisses.

For the purpose of this study, physiographic variability was controlled by subdividing the area into four major landform types, defined by the BLM: mountain, mountain valley, desert valley, and canyon (Figure 3). These general divisions were used to stratify the areal sampling. Given the gradational geomorphic context, however, mountain strata within the seven study sections exhibit considerable heterogeneity in specific relief, hydrologic features, and vegetative

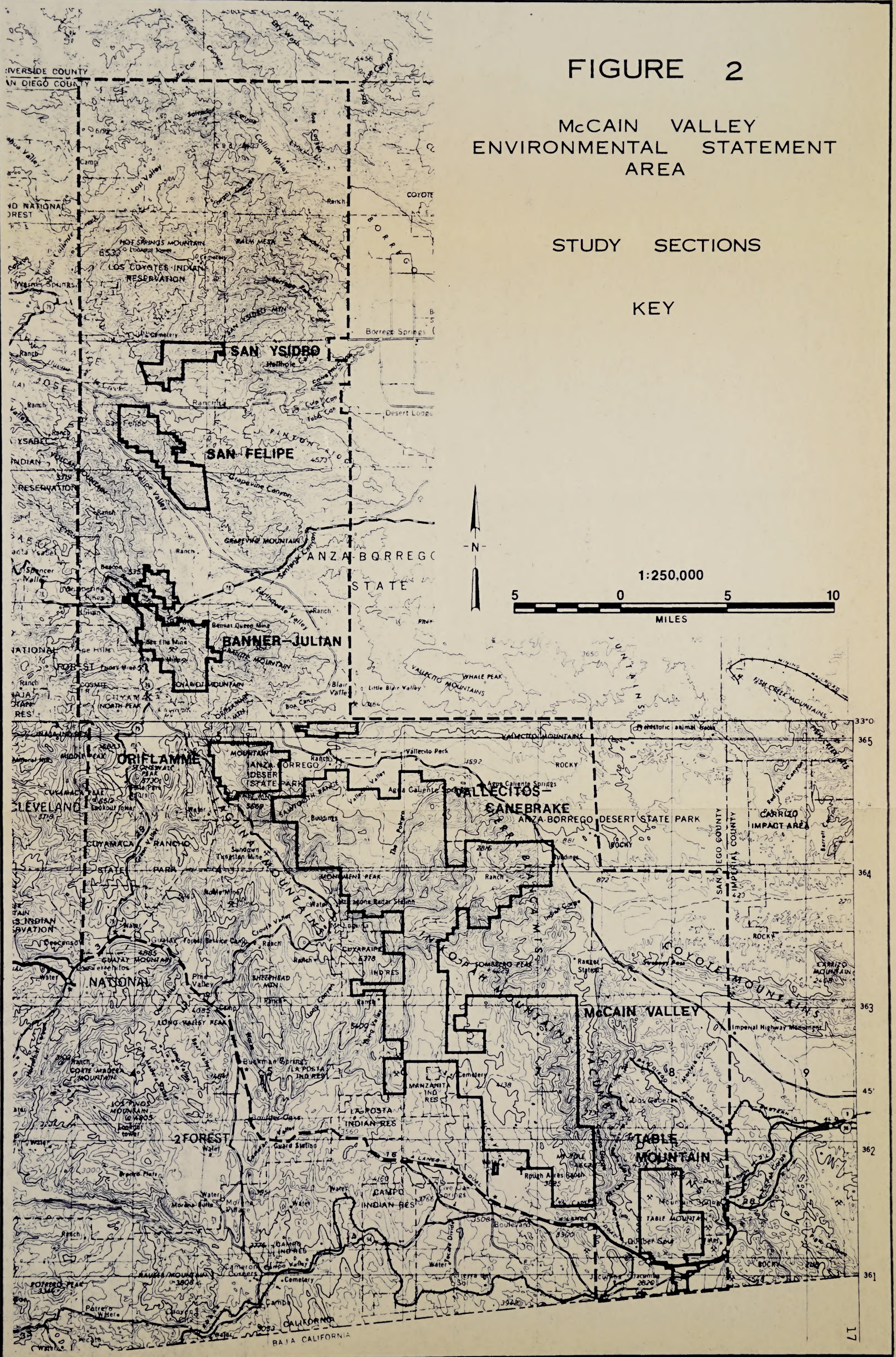


# FIGURE 2

## McCAIN VALLEY ENVIRONMENTAL STATEMENT AREA

### STUDY SECTIONS

#### KEY









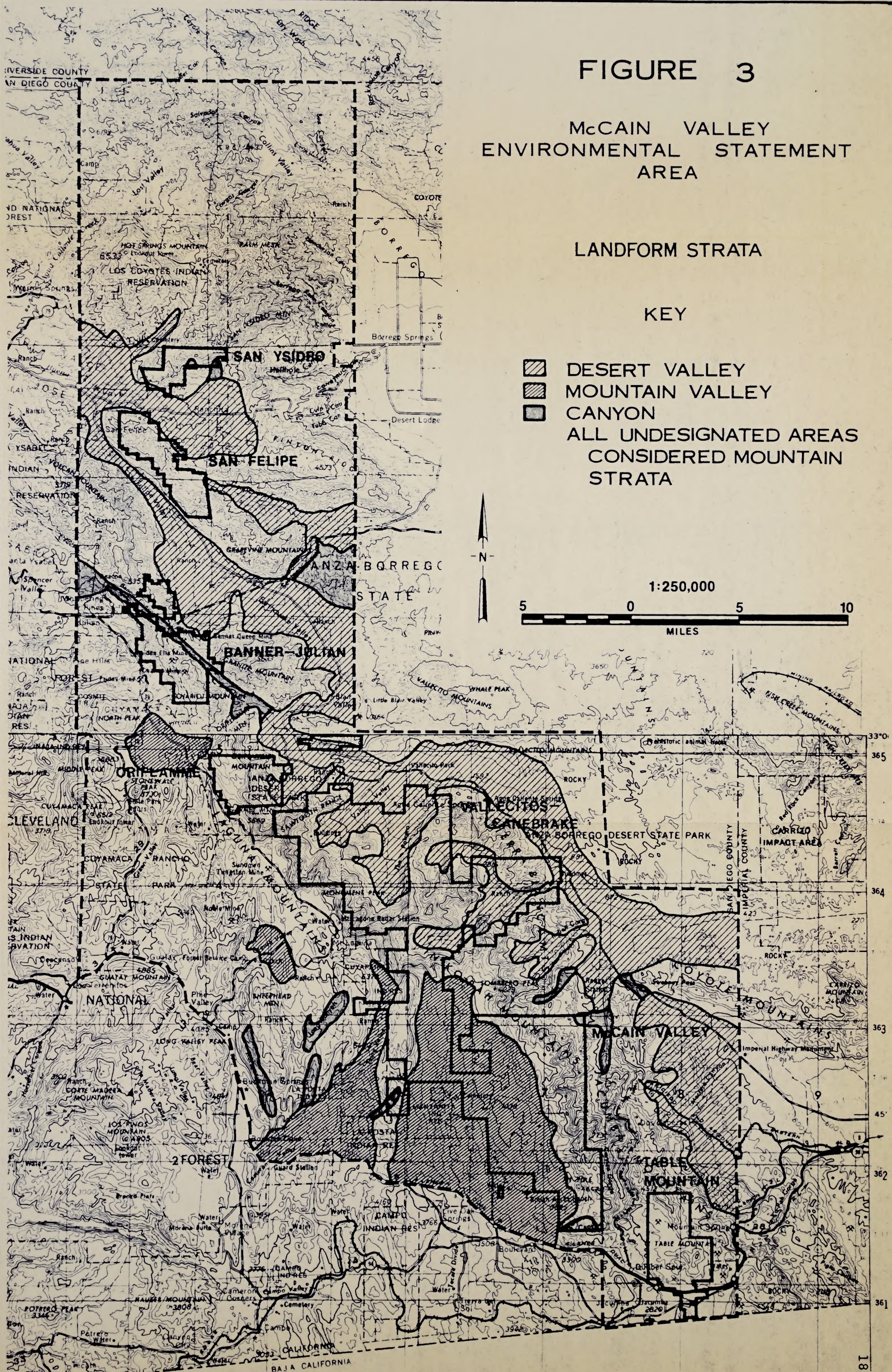


FIGURE 3

McCain Valley  
ENVIRONMENTAL STATEMENT  
AREA

LANDFORM STRATA

KEY

-  DESERT VALLEY
-  MOUNTAIN VALLEY
-  CANYON
- ALL UNDESIGNATED AREAS  
CONSIDERED MOUNTAIN  
STRATA







characteristics, from Table Mountain to San Felipe. The initial stratification represents only a gross sub-division of the region, rather than a specific landform classification. More specific descriptions of regional landforms are provided in the section descriptions.

### Hydrology

Climate. The east-west altitudinal gradient imposed by the Peninsular Range and its descent to the Salton Trough, in conjunction with broader climatic processes operating in Southern California, has resulted in a rain shadow belt which includes the study area. In this area, average annual precipitation is between 5 and 10 inches. Temperature ranges from 30° minimum daily in January to 105° maximum daily in July (Griner and Pryde 1976). According to the Koppen Classification, climates include Arid, Semi-Arid, Hot, Mediterranean Cool Summer, and Mediterranean Hot Summer.

Drainage Features. Structural control of spring occurrence and surface drainage patterns is evident in many parts of the study area. Most obvious is the southeastward flow of many of the major drainages in northwest-southeast trending fault block valleys. Many smaller water courses join major streams at approximately right angles, indicating significant control by joint systems and by faults transverse to the regional structural trend. Springs are often associated with faults or rise near the bases of alluvial fans on valley margins.

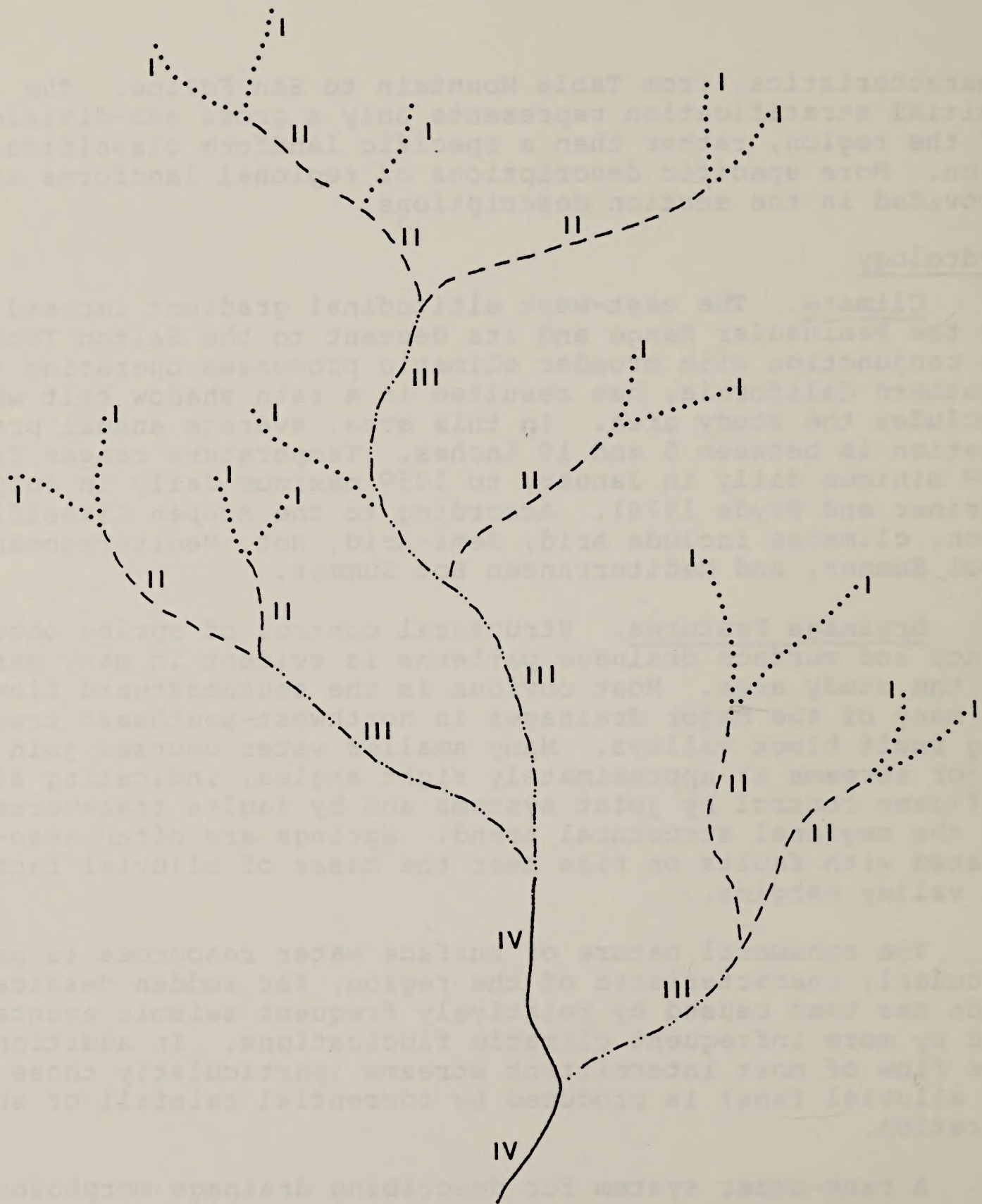
The ephemeral nature of surface water resources is particularly characteristic of the region, for sudden dessication has been caused by relatively frequent seismic events and by more infrequent climatic fluctuations. In addition, the flow of most intermittent streams (particularly those on alluvial fans) is produced by torrential rainfall of short duration.

A rank-order system for describing drainage morphology was applied to this study, based on the technique developed by Strahler (1964).

According to his system, fingertip tributaries at the head of a stream system are designated as first-order streams. Two first-order streams join to form a second-order stream segment; two second-order streams join, forming a third-order, and so on (Morisawa 1968).

(See Figure 4 for an illustration of this rank-ordering system.) The intersection of a Rank II drainage with a Rank III drainage does not upgrade the rank, nor does it downgrade the rank. Likewise there is no cumulative accession, that is, the absolute number of drainages does not provide the index. From U.S.G.S. 7.5 minute topographic series maps, the drainages measured were those represented by blue lines; contour





- |     |             |            |
|-----|-------------|------------|
| I   | .....       | RANK ONE   |
| II  | ----        | RANK TWO   |
| III | - . - . - . | RANK THREE |
| IV  | ————        | RANK FOUR  |

Modified after Morisawa  
 "Streams", 1968, pg 153

Stream Rank Ordering System

FIGURE 4



lines with "V's" pointing upslope, representing washes, were not considered as hydrologic sources.

The major catchments that drain the area are described below. Specific drainage patterns within each of the seven sections are provided in their respective summaries.

#### Montezuma Valley

Buena Vista Creek, a Rank III stream, flows west through Montezuma Valley. The associated catchment area consists of four Rank II streams and one Rank I stream, emanating from the southern slope of the San Ysidro Mountains. In addition, one Rank II and one Rank I stream flow from the northern portion of the San Felipe Hills, the landform bordering the southern edge of Montezuma Valley.

#### San Felipe Valley

San Felipe Creek, a Rank III stream, flows south through San Felipe Valley. It is fed by several intermittent Rank I streams descending from the western flank of the San Felipe Hills. In addition, several Rank I and II streams flow from the eastern slopes of the Volcan Mountains, situated on the western edge of San Felipe Valley. San Felipe Creek and Banner Creek, a Rank IV drainage flowing east from Banner Canyon, are the major drainages flowing through San Felipe Valley. Banner Creek is intersected by Chariot Canyon, a Rank III drainage, flowing out of the northeastern slopes of the Cuyamaca Mountains. Banner Creek and San Felipe Creek form a drainage which ultimately enters the northern end of Earthquake Valley, flows east through Sentenac Canyon, and eventually becomes a braided stream as it enters Borrego Valley.

#### Carrizo Valley

South of Banner Canyon, Rodriguez Canyon and Oriflamme Canyon, both Rank II streams, flow to Mason Valley, and Vallecito Wash. At this point, Vallecito Wash is intersected by the Cottonwood Canyon and Salt Creek drainages, the former a Rank III stream, the latter a Rank II. Thus Vallecito Wash becomes Vallecito Creek as it flows through Vallecito Valley. Storm Canyon and The Potrero, both Rank III drainages, enter Vallecito Valley from the south; Vallecito Creek at this point becomes a Rank IV stream, and enters Carrizo Valley.

Two drainages flow from the Canebrake drainage system. The northernmost, an unnamed Rank III stream, enters Carrizo Valley through an unnamed canyon. The southernmost flows through Canebrake Canyon and comprises a Rank II stream, North Wash, and a Rank III stream, Canebrake Wash.

Torote Canyon and the North and South Forks of Indian Valley, all Rank II streams, intersect in Indian Gorge,



forming a drainage that becomes a braided stream as it enters Carrizo Creek. Bow Willow Creek enters Carrizo Valley as a Rank III stream emanating from the In-Ko-Pah Mountains. Carrizo Creek is a Rank III stream fed by the Rockhouse Canyon drainage, a Rank II stream, and the Rank III stream flowing through Carrizo Canyon, the landform which separates the In-Ko-Pah and Jacumba Mountains.

#### McCain Valley

Tule Creek, a Rank III stream, is the major drainage of McCain Valley, flowing through its middle in a southerly direction. East of Tule Creek is Lark Canyon, a Rank II stream emptying into McCain Valley.

#### Jacumba Valley

The southernmost drainage system in the study area is Jacumba Valley, lying on the International Border. It is fed by several unnamed Rank I and Rank II streams.

#### Vegetation

The study area lies in a transitional environmental zone. Within the area, the variability of vegetational habitats is dependent on associations with geomorphology, geology, and hydrology. In addition, proximal distribution of plant communities has been subject to the effects of fire of both natural and artificial origin.

Specific geomorphic, geologic, and hydrologic factors provide the setting in which a given plant community exists, determining both vegetation type, and densities. Geomorphic reduction processes have resulted in the deposition of numerous soil types based on various bedrock lithologies and slope gradients. Relative location within the rain shadow of the Peninsular Range, and proximity to springs and streams provide the hydrologic context of vegetation types. Over the past several thousand years, increasing aridity has contributed to change in certain vegetation distributions. Notably, the distribution of Pinus monophylla (pinyon), a component of the coniferous forest vegetation type, has decreased significantly. Unfortunately, the last remaining stand of pinyon, covering some 35,000 acres southeast of the Laguna Mountains, was completely decimated by fire in 1942 (Griner and Pryde 1976:43). Fire has also contributed to shifts in the proximal distribution of specific plant communities.

It is reasonable to assume that (due to fire, and the subsequent encroachment of chaparral) the lower edge of the forest has been rising slowly but more or less continuously during the last 10,000 years (Aschmann 1959:41).

The following vegetation types and their associations



were provided by the Bureau of Land Management (see Figure 5).

#### Sonoran Creosote Bush Scrub

The soils tend to be well-drained, coarse sandy loams derived from granitic alluvium. Slopes are usually gentle, ranging from 0 to 5 percent. Elevation ranges from 1200 to 1800 feet, and the mean annual precipitation is between 4 and 6 inches. The vegetation is primarily desert scrub, including: creosote bush, brittle bush, burro-bush, ratany, cholla, and goldenhead. Other economic plants associated with this vegetation type include: agave, desert willow, indigo bush, barrel cactus, ocotillo, beavertail cactus, arrowweed, mesquite, screwbean, chia, and jojoba.

#### Enriched Desert Scrub - Lowland Type

This vegetation type is found on gently to moderately sloping soil on alluvial fans. Slopes are usually 2 to 9 percent and soils loamy coarse sands. Elevations range between 1600 to 2600 feet; precipitation between 4 and 7 inches per year. Vegetation appears similar to Sonoran Creosote Bush Scrub, but compositions and densities are different. Species include: cheese bush, saltbush, burro-bush, desert senna, white sage, California buckwheat, and sandmat. Other economic plants include: agave, desert willow, indigo bush, barrel cactus, ocotillo, beavertail cactus, arrowweed, mesquite, screwbean, chia, jojoba, and several species of Prunus.

#### Enriched Desert Scrub - Upland Type

This type is found on very steep and rocky topography. Soils are made of decomposed granite. Precipitation varies with elevation, but is usually between 5 to 8 inches. Elevation ranges between 2000 and 3400 feet. Vegetation patterns tend to be open and sparse among the large boulder outcrops. Plant species include California buckwheat, brittlebush, cholla, desert century plant, and some sumac. Several other economic plants are associated with this vegetation type including: agave, desert willow, indigo bush, barrel cactus, ocotillo, beavertail cactus, arrowweed, mesquite, screwbean, chia, and jojoba.

#### Desert Chaparral

This type is found on generally underdeveloped soils with a high percentage of large rocks and boulders. Elevation ranges between 2800 and 4200 feet. Slopes are steep to moderate ranging from 5 to 30 percent; precipitation is probably between 7 and 10 inches per year. Vegetation patterns tend to be open with some herbaceous understory plants. Plant species are typically chaparral elements, including: California juniper, sumac, mountain mahogany, cupleaf clanothus, desert apricot, and catclaw. Others include: agave,



desert willow, indigo bush, barrel cactus, ocotillo, beaver-tail cactus, arrowweed, mesquite, screwbean, chia, and a variety of Prunus spp.

### Chaparral

This vegetation type is found on poorly developed soils usually of decomposed granite. Topography is variable, ranging from gentle slopes to very steep inclines. Elevation ranges from 3500 to 5000 feet and precipitation averages around 12 inches per year. Vegetation patterns vary from very dense sumac and enclaves of coast live oak. Other economic plants include manzanita, mule fat, toyon, lemonade-berry, white sage, chia, jojoba, yucca, and canyon oak.

### Coniferous Forest

This type is typically found above 5000 feet and receives precipitation above 17 inches. Species include: pinyon, ponderosa pine, Jeffery pine, and big cone spruce. Other economic plants include: canyon oak, Prunus spp.

Located within these broad types are several rare or unique plant associations. Two of these associations--Fan Palm Oasis and Riparian Woodlands--are relics and occur in isolated microhabitats.

### Fan Palm Oasis

The Fan Palm is a relic species now limited to sites with water availability. This association is found as small inclusions within the Enriched Desert Scrub - Upland Type. There are probably less than 100 major fan palm oases left in the California Desert and nearby areas.

### Riparian Woodlands

This association is found along drainages and areas of high water table. The riparian areas provide significant wildlife habitats and are considered a valuable resource. Plant species include cottonwood, coast live oak, sycamore, white alder, and western redbud.

## 2.2 PHYSICAL CHARACTERISTICS OF THE STUDY SECTIONS

### San Ysidro Mountains

The most northerly portion of the BLM administered lands is a 4.19 square mile area situated north of Montezuma Valley. The predominant landform in this section is the southwestern extension of the San Ysidro Mountain Range which descends to Buena Vista Creek, the primary drainage in Montezuma Valley. From the valley floor, a 50 percent average slope gradient ascends to mountainous summits approximately 5800 feet above Mean Sea Level.



The northeast-southeast axial trend of San Ysidro Mountain is approximately perpendicular to the San Jacinto and Agua Caliente Fault Zones which cross the northeast and southwest margins of the mountain respectively. Exposures on San Ysidro Mountain are composed predominantly of Pre-Cenozoic granitic and metamorphic rocks such as foliated migmatites and included bodies of schist and quartz diorite, while in surrounding areas undifferentiated granitic intrusives, with a range of local lithologies, including granites, diorites, quartz monzonites, and some syenite and gabbro. In the western area of the section (near the southwestern limits of San Ysidro Mountain) an isolated Mesozoic tonalitic stock is exposed as well as Pre-Cretaceous metasedimentary units which include schist, quartzite, gneiss, and local interbedded crystalline limestone. Geomorphic physical reduction processes operating on these rocks, along with the effects of vegetation, have resulted in the development of well-drained coarse sandy loam soils (Tollhouse-La Posta-Rock land associations) throughout the area.

The San Ysidro Mountains section, on the south-facing slope of San Ysidro Mountain, is dissected by several drainages. These drainages are comprised of Rank I and Rank II streams which flow to the south and southwest. The easternmost portion of the drainage system, including Cherry Canyon and Bertha Canyon, culminates in a Rank III stream, Buena Vista Creek, in Montezuma Valley. The only spring noted within this section occurs at the head of Buck Canyon. However, Oak Spring, Government Springs, and several unnamed springs occur just south of the area on slopes descending to Cherry Canyon and within Cherry Canyon.

The vegetation in the section is comprised of chaparral and coniferous forest plant communities. The conifers constitute less than ten percent of the vegetative cover, occurring on the extreme northern edge of the section. Both habitats were exploited by prehistoric populations. The economically significant plants in the chaparral community include: chamise, sumac, scrub oak, coast live oak, white sage, chia, jojoba, and yucca.

### San Felipe Hills

The San Felipe Hills are situated on the eastern edge of San Felipe Valley. The landform conforms to the general northwest-southeast trending orientation resulting from the large scale structural processes (faulting being most conspicuous) associated with the region. The 9.0 square mile area rises from the valley floor at a 50 percent average gradient, ascending to an uneven ridgeline averaging 4000 feet above Mean Sea Level.

Geologic units in the area are limited to Pre-Cenozoic



granitic rocks and their respective metamorphosed constituents: schist, quartz diorite, and gneiss, and form a continuous outcrop belt with San Ysidro Mountain, although lying perpendicular to it. Soils in the area consist of several material types, resulting from geomorphic reduction processes operating on the varied geological components. The soil types range from fine sandy loam to coarse sandy loam and, in the drainages, recent alluvium having a more gravelly texture.

The drainage pattern primarily consists of Rank I streams, although two Rank II streams flow southeasterly to Grapevine Canyon, and six Rank I streams flow to the north, emptying into Buena Vista Creek. Eleven Rank I streams flow west into San Felipe Creek. Three springs are mapped in the area.

The climate in this area ranges from Semi-Arid at the lower elevations to Mediterranean Hot Summer at the higher elevations, particularly in the northern portions. Lying at the interface of the mountain and desert geomorphic provinces, and thus in the Peninsular Range rain shadow, annual rainfall rarely exceeds ten inches.

The predominant vegetation type in this area is chaparral, though desert chaparral can be found on the more southerly slopes. Plant genera associated with the chaparral community include chamise, sage, sumac, scrub oak, and some coast live oak. Some genera of interest observed within the desert chaparral community include sumac, desert apricot, catclaw, and agave.

#### Banner/Julian

The Banner/Julian area is an 11.5 square mile parcel dissected by Banner Canyon which trends northwest-southeast. The northern portion is in the southeastern sloping extension of the Volcan Mountains, rising from 2800 feet to 4800 feet above Mean Sea Level. The southern portion rises sharply from 3000 feet to 5000 feet above Mean Sea Level, and is situated on the northeastern slope of the Cuyamaca Mountains.

Geologically, this area is characterized by a complex of Pre-Cenozoic plutonic and metamorphic rocks cross-cut by the northwest-southeast trending Elsinore Fault Zone. The western edge of the large tonalitic intrusion of Granite Mountain is included in the southeastern area of this section. Along the western edge of the Banner/Julian area a belt of Pre-Cretaceous metasedimentary rocks parallels the trend of the Elsinore Fault Zone and in the northern areas Pre-Cenozoic granitic and metamorphic rocks are exposed. The predominant rock types include granite, gabbro, schist, and gneiss. Numerous inactive gold mines and prospects, associated with mineralization along the Elsinore Fault Zone



occur throughout the area. Weathering has resulted in a variety of soil types ranging from fine sandy loam to loamy coarse sand.

The northern portion of this section has nine Rank I streams which flow east to San Felipe Valley. In addition, four Rank I streams flow south to Banner Canyon. The southern portion is dissected by two north-south trending canyons, Chariot and Rodriguez Canyons. The former is a Rank II drainage fed by fourteen Rank I streams, the latter a Rank II drainage fed by five Rank I streams. No springs are shown in this area on the U.S.G.S. 7.5 minute topographic quadrangle.

The principal vegetation types are chaparral and desert chaparral. A small amount of enriched desert scrub and coniferous forest also occur in the area. Economic plants include scrub oak and coast live oak associated with the chaparral community, and sumac, desert apricot, and catclaw from the desert chaparral. Buckwheat, brittlebush, cholla, desert century plant, and sumac are associated with the upland enriched desert scrub. Conifers associated with the forest community include pinyon, ponderosa pine, Jeffery pine, and big cone spruce.

#### Oriflamme

Comprising slightly less than seven square miles, the Oriflamme section is composed of mountain and desert valley landforms. Rising at a 50 percent average slope gradient, the eastern flank of Oriflamme Mountain ascends from 2200 to 4600 feet above Mean Sea Level. The western flank descends to Oriflamme Canyon, at 3600 feet above Mean Sea Level.

Oriflamme Mountain is a north-south trending range marginal to the Laguna Mountains on the southwest. It is composed of Pre-Cretaceous metasedimentary rocks (predominantly schists), Pre-Cenozoic granitic and metamorphic rocks (pegmatites, granitoid dikes, gneisses, and schists), and local Mesozoic granodioritic intrusions. Desert valleys east of Oriflamme Mountain contain Pleistocene and Recent (Holocene) alluvial fan deposits comprised of fanglomerates, conglomerates, and sandstones. Soil types derived from these lithologies are well drained silt loams, sandy loams, and stoney loams.

Two Rank I and Rank II streams are found on the western slope of Oriflamme Mountain and two of each rank are on the eastern slope. Taylor Spring, located at the head of a wash in the western portion of Mason Valley, is the only spring in the area.

Climatically, the area is characterized as Arid, with an annual rainfall averaging between 5 and 10 inches. Winter



temperatures are as low as 32°, whereas summer temperatures reach 100° or more.

All vegetation types, excluding conifers, are present in this section. Proportionately, the chaparral community is the predominant type, although other types are present in substantial quantity. Thus, a wide range of plants are available in this area: cheesbush, saltbush, burro-bush, white sage, cholla, California buckwheat, agave, sumac, mountain mahogany, desert apricot, catclaw, chamise, scrub oak, and California juniper.

#### Vallecito/Canebrake

This section consists of 56 square miles of mountain, mountain valley, and desert valley landforms. The variability in landform is evidenced in local relief, where elevations range from 1800 feet in the valleys to 4500 feet in the mountains, and slope gradients vary from near zero to well over 60 percent in some areas.

Pre-Cenozoic granitic and metamorphic rocks and Pleistocene and Recent (Holocene) alluvial deposits are the predominant lithologic types. In northern portions of the section the principal bedrock units are Pre-Cretaceous meta-sedimentary rocks, whereas in the southern and eastern areas granitic intrusions with tonalitic and quartz dioritic compositions predominate. Sedimentary deposits are predominantly alluvial fan deposits and stream alluvium in Vallecito Valley and other valleys. Soil and sediment types from these variable lithologies are: coarse sand, gravelly sand, fine sand, rocky fine sandy loam, silt loam, coarse sandy loam, fine sandy loam, and loamy coarse sand.

Two major drainage patterns are situated in this section. The Canebrake system has eleven Rank I, nine Rank II, and one Rank III streams. Vallecito has nineteen Rank I streams, twelve Rank II streams, three Rank III streams, and one Rank IV stream. One spring is mapped in this area.

The climate in this area is Arid, with an annual rainfall between 5 and 10 inches and a temperature range of 32° in winter to 100° in summer.

Nearly all vegetation types are present in the study area; only conifers are absent. The predominant vegetation is enriched desert scrub, both lowland and upland varieties. Desert chaparral constitutes slightly more than twenty percent of the flora, while creosote bush and chaparral together constitute nearly fifteen percent. Economic plants include buckwheat, white sage, sumac, California juniper, desert apricot, chamise, coast live oak, catclaw, chia, jojoba, screwbean, and yucca.



### McCain Valley

Consisting of 59 square miles, this section is comprised of mountains, mountain valley, canyon, and a small portion of desert valley landforms. Elevation and slope gradient vary throughout the area, but are most extreme on the eastern edge where canyons occur.

Bedrock types consist of granitic, metasedimentary and metamorphic, and volcanic materials. Exposed lithologies include Pre-Cretaceous metasedimentary units (principally quartz, mica, schist, and quartzite) in a north-south trending belt just east of Thing Valley in the northwest portion of the area. In the central portions of the section around In-Ko-Pah Mountain, there is a wide area of the Southern California Batholith which is composed predominantly of tonalite and/or quartz diorite. A north-south trending fault branching from the Elsinore Fault Zone separates the tonalitic intrusives on the west from Pre-Cenozoic schists and granodiorites in the east. Near the northeastern and southern boundaries of the section are patches of extrusive Miocene volcanics of andesitic composition.

Soil types in the area include rocky coarse sandy loam, loamy coarse sand, very gravelly sand, rocky loamy coarse sand, coarse sandy loam, rocky fine sandy loam, stoney fine sandy loam, fine sandy loam, and loamy alluvial land.

Three major drainage systems are in this section. The McCain area has five Rank I streams, five Rank II, and one Rank III. The Carrizo/Rockhouse Canyon area has 22 Rank I streams, 13 Rank II, and one Rank III. The Bow Willow area has more than 20 Rank I, eight Rank II, two Rank III, and one Rank IV stream. Several springs are shown on the U.S.G.S. topographic maps. Most springs occur on canyon margins or are otherwise close to intermittent drainages.

Climate ranges between Arid, Semi-Arid-Hot, and Mediterranean Hot Summer. Between 5 and 10 inches of precipitation falls annually, and temperature ranges between a low of 32° in winter and a high of 100° in summer.

Vegetation types include enriched desert scrub, chaparral, and desert chaparral. Economic plants include buckwheat, white sage, sumac, California juniper, desert apricot, coast live oak, catclaw, chia, screwbean, jojoba, and yucca.

### Table Mountain

This section lies in the southeasterly portion of the study area. Consisting of 10.5 square miles, it is composed of mountain and mountain valley landforms. Elevation ranges from 3000 to 4000 feet above Mean Sea Level. Slope gradients range from near zero to 40 percent.



Geologically, the area contains several different exposed lithologic units. Extrusive andesitic volcanic flows and pyroclastics of Miocene Age are in the high elevations of Table Mountain and are cross cut by several northwest-southeast trending high-angle faults. At lower elevations to the north, east, and west are outcrops of tonalitic and quartz dioritic intrusives of the Southern California Batholith. Recent (Holocene) alluvial deposits and Pleistocene alluvial fan deposits occur south and southeast of Table Mountain in Carrizo Creek Valley. Predominant soil types are silty and sandy loams.

This area is part of the larger area drained by the Carrizo Gorge drainage system ultimately flowing north to Carrizo Valley. However, the southern portion of the section is incorporated into the drainage area flowing south to Jacumba Valley. No springs are shown on the U.S.G.S. topographic maps.

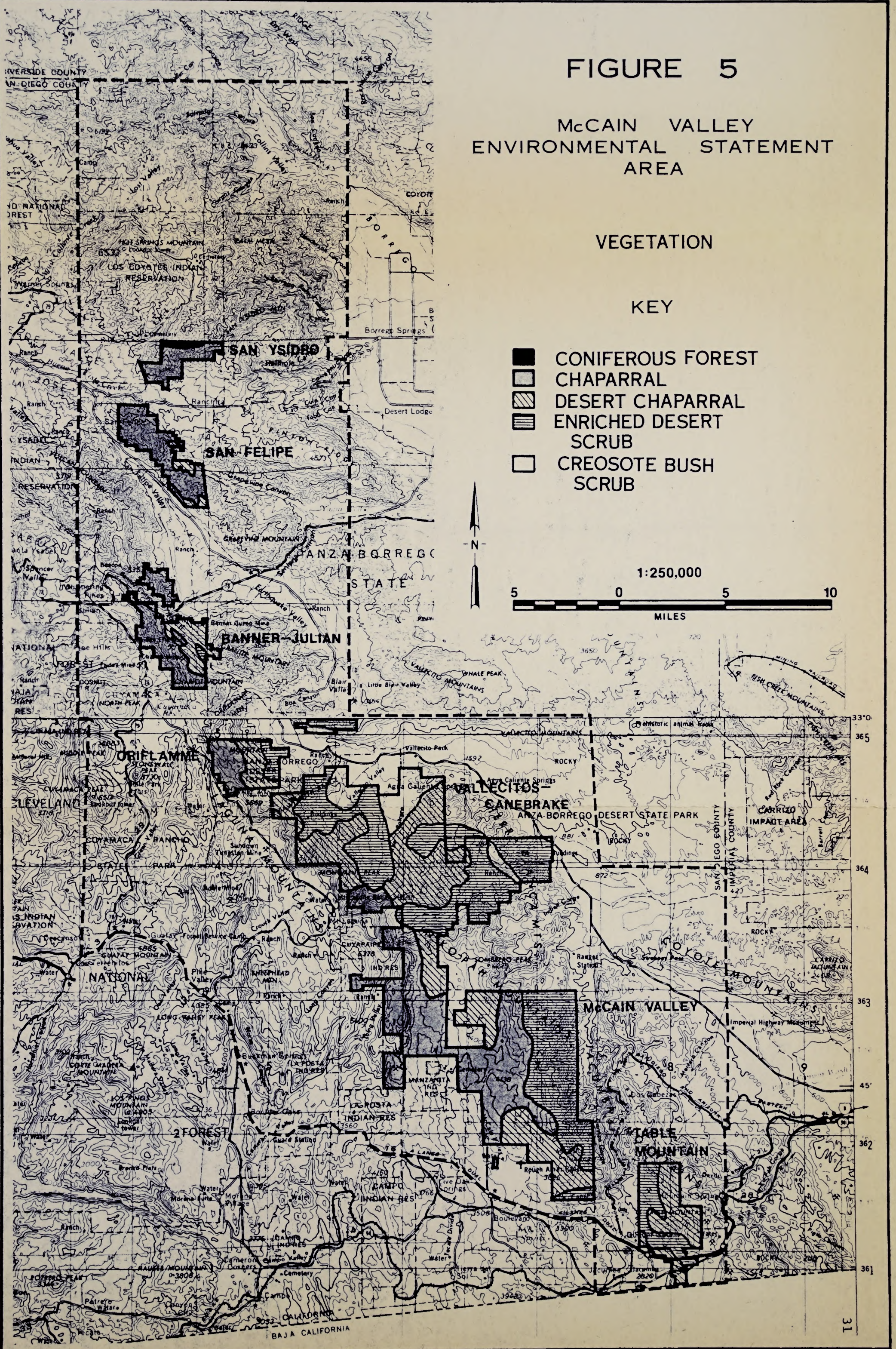
The climate is Semi-Arid-Hot, with 5 to 10 inches of rain annually. Temperatures range from 36° in winter to over 100° in the summer.

Desert chaparral and enriched desert scrub are the vegetative types found in the area. Economic plants include California juniper, sumac, desert apricot, catclaw, agave, screwbean, chia, buckwheat, ocotillo, beavertail cactus, barrel cactus, cholla, and various Prunus species.



McCAIN VALLEY  
ENVIRONMENTAL STATEMENT  
AREA

## KEY









### III. RESEARCH - PREHISTORY

The principal focus of the overall study effort was directed at collecting and analyzing a statistically valid sample of archaeological sites and features to support land use planning and management studies. Specific goals, as outlined by BLM, included:

1. Recognition or elaboration of patterns of past human use and occupation.
2. Determination of the cultural resource potential of the study area.
3. Prediction of zones of greater or lesser activity by past human populations.
4. Identification and assessment of the environmental and/or cultural variables, or combination of variables, that form the most accurate predictors of cultural resource sites.
5. Development of projections of expected density distribution and diversity of cultural resources.
6. Discovery of the range of cultural resource variability within the study area.
7. Development of a research design for the study areas to provide direction for future research and a basis for formulating and evaluating mitigation plans.

While previous research within the planning unit (see Wirth Associates, 1978) has produced an extensive file of site records, the independent, non-systematic nature of these inventories does not constitute a statistically valid sample from which site population estimates can be derived. A controlled, systematic sample inventory was necessary, therefore, to generate density estimates, assess formal and temporal variability, and isolate environmental factors that may be useful for positing models of settlement distributions within the region.

In addition to establishing systematic estimates of resource variability and distribution, a comprehensive summary of resources within each sub-region of the study area was developed by compiling and analyzing existing site records, and synthesizing results from both sources. These data, published research, and ethnographic and ethnohistoric notes were reviewed to generate an areal summary, isolate major deficiencies in the data base and suggest avenues of future research appropriate to resources found in the region.



Research on topics of specialized interest were also undertaken. Ceramics, flaked lithic artifacts, and obsidian were collected during field study to experiment with ways of setting temporal and functional parameters for surface assemblages, as these are of specific concern to proposed models of settlement and adaptational responses to major environmental changes. Detailed type descriptions for non-systematic ceramic collections were prepared by Ronald V. May, to assess the range of variability within sub-regions. Obsidian samples were submitted for hydration analysis at UCLA, to set an initial range of values for the region and test the efficacy of applying this technique to dating of occupational phases. A discussion of the distribution and function of agave roasting pits is presented, as these are the most numerous cultural features found in the area. Finally, a purposive inventory of rock art sites and features was conducted by Ken Hedges, as these are of special interest to a wide following, but would otherwise be underrepresented in the study results due to the nature of probabilistic sampling.



### 3.1 Background

This section provides a brief introduction to the cultural sequence and previous investigations of the McCain Valley Study Area as background information for the research presented in later sections. Since no specific, regional sequence of archaeological cultures has yet been developed, it is necessary to depend upon existing site records, and extrapolate from sequences for better documented adjacent areas. That proposed is therefore more properly a composite and tentative. Because of its location, the study area is expected to be a geographically transitional zone, the prehistoric record reflecting occupation by and influence from cultures residing in the greater Coastal Province to the west of the Peninsular Range and the Colorado Desert to the east. Overviews for the Yuha area of the Colorado Desert (Weide and Barker, 1974) and Inland San Diego County (Wirth Associates, 1978) both contain detailed discussions of prehistory and ethnography of pertinence here, and the reader is referred to them for additional background data. In general, all agree that the prehistoric populations were greater affected by variable paleoenvironmental conditions during the Late Pleistocene and Holocene. The sequence includes a hypothetical Pre-Projectile Point/Early Man component, a Paleo-Indian cultural manifestation known as the San Dieguito, several variants of the Early Millingstone Horizon, and a Late Prehistoric period.

#### Cultural Sequence

The presence of Early Man in Southern California is at present a subject of some controversy. Dates of 48,000 B.P. (Before Present) and 23,000 B.P. have been reported for sites on the San Diego littoral (Bada et al., 1974; Rogers, 1974), while in the Yuha Desert radiocarbon dates obtained on calcium carbonate from a burial cairn ranged from 21,500 to 32,000 B.P. (Childers, 1974). However, these claims have been criticized on the basis of the dating technique (amino acid racemization), on the basis that the artifacts themselves may not be of human origin, and on the origin or derivation of the carbon sample dated (Hare, 1974; Meighan, 1965; Williams and Polach, 1971). Most archaeologists would admit that an early occupation is possible, but until more and better data are available the subject will continue to be viewed with some skepticism.

It is the San Dieguito, a Paleo-Indian group, which most archaeologists accept as the earliest inhabitants. The initial date for the San Dieguito has been estimated to be about 12,000 B.P. Several theories have been suggested for San Dieguito origins, although none have been conclusively proven. M. Rogers found widespread similar assemblages ranging from Oregon to Wyoming and extending as far south as the midpoint of Baja California. Warren (1961), Meighan (1965), and Moriarty (1969), hypothesize that the San Dieguito migrated



from the Great Basin, whereas Davis (1974) suggests diffusion from the now-extinct desert lakes of California. Most agree that the move was the result of environmental change, and that San Dieguito entry into western San Diego County was via Jacumba Pass.

Davis and Brott (1969) summarize the typical San Dieguito assemblage as containing heavy "horse-hoof" planes, which were probably used as scrapers, a variety of other kinds of scrapers which may have been hafted, choppers made on large, heavy primary flakes, a variety of large knives or points, the rare crescentic stones of unknown use, thick primary flakes, and thin trimming and finishing flakes. Flaking was frequently bifacial and of good quality.

The San Dieguito were probably a generalized hunting and gathering society, organized into small bands. The climate during this period was cooler and moister than today, resulting in juniper-pinyon pine forests and moisture-loving plants on the fringes of lakes and streams. The San Dieguito peoples undoubtedly used these resources, as well as hunting deer, elk, and many small game animals. The ending date for this phase is generally accepted as being between 8500 and 7500 B.P. (Warren, True and Eudey, 1961), at which time the San Dieguito either migrated south, or, as is suggested by several archaeologists, evolved into the cultural groups represented in the Millingstone Horizon (e.g. La Jolla, Pinto, Amargosan).

Early Millingstone Horizon manifestations in the eastern desert portion of the study area are sparse and consequently much less well-documented. This Horizon was widespread. From the paucity of sites, it is generally assumed that these groups known as the Pinto and Amargosa, were highly mobile, few in number and size, and emphasized hunting in contrast with those of the coastal aspect where gathering predominated. Sites are characterized by distinctive projectile point types and occur along now mostly extinct watercourses and shallow lakes.

The Pinto Culture is generally dated between 7,000 and 4,000 B.P. Its name derives from investigations conducted by Campbell and Campbell (1935) at Pinto Basin in northeastern Riverside County where a series of encampments were found along a relic watercourse. Surface collections resulted in an abundance of flaked stone implements including the Pinto points (concave based points with weak, narrow shoulders), leaf-shaped points, knife blades, drills, scrapers, scraper planes, choppers and hammerstones; groundstone was also present, but in relatively small numbers (Wallace 1962). Artifacts similar to those from Pinto Basin were also excavated from the lowest stratum of a rock shelter within the study area (Wallace and Taylor, 1958).

Even less is known of the subsequent Amargosa phase dating from 4,000 B.P. to roughly 2,000 B.P. Like those of the Pinto,



Amargosa sites are found in association with dry lakes or former watercourses, and exhibit assemblages with few milling implements. They differ, however, in stylistic variations in their respective point types, the Amargosa having large stemmed and notched projectile points with triangular blades, often referred to as Elko points in the Great Basin (Weide and Barker, 1974). Rogers (1939) recognized two phases, each with its own distinctive projectile point forms. Those of the earlier phase were corner-notched dart tips with squared bases, whereas in Phase II true arrowheads eventually replaced the larger points indicating acquisition of bow and arrow technology (Wallace, 1962). This latter phase may in some way have been related to a preceramic Yuman pattern described by Rogers (1945) in the Mohave Desert.

Between the coast and desert proper, True (1958) identified a complex in northeastern San Diego County possessing artifacts typical of the San Dieguito, La Jolla, and more broadly defined "Desert Culture." Termed the Pauma Complex, and representative of the Early Millingstone Horizon, there is currently no agreement on the origin or relationship of this archaeological culture to others such as the La Jolla or San Dieguito. In general, Pauma sites are located on knolls or terraces near intermittent streams, but above major drainages. The sites are shallow, and generally lack midden or house features, indicating short-term occupation. Manos and deep basin metates are present, as well as scrapers, leaf-shaped and triangular unnotched projectile points, crescentics, and blades. The flaked stone tools are frequently made from non-local jasper and chalcedony. The use of non-local stone and the presence of exotic shells indicate the existence of an extensive trade network.

The coastal variant of the Early Millingstone Horizon has been identified as La Jolla. The inland extent of the La Jolla and thus possible presence within study area is unknown, although increasingly evidence suggests sparse occupation of western foothills of the Peninsular Range. Generally accepted dates for the appearance of the La Jolla tradition range from 7,500 B.P. to 9,000 B.P. Like their predecessors, the La Jolla were hunters and gatherers, but with an emphasis on the gathering of plant resources and an increased reliance on marine resources. This led to a more sedentary existence, predominantly along the immediate coastal littoral. A typical La Jolla site would contain manos, metates, shell, rather crudely shaped flaked stone tools, drills and polished stone artifacts, and a variety of projectile points, some of which were suitable for hafting on arrows. The La Jollas buried their dead, either on the living sites (early) or in separate defined cemeteries (late).

According to True (1966), by 3,000 B.P., two separate patterns are recognized with the La Jolla culture: (1) a land-based gathering subsistence economy, and (2) a retention



of the basic marine-oriented subsistence pattern in certain areas with the subsequent development of a quasi-maritime economic base. An established trade network existed during this period in which material items and cultural traits flowed between the western San Diego County coastal groups and those in the Colorado River area. Probably the land-based groups mentioned above, as well as the desert Amargosan and Yuman peoples, acted as intermediaries in this trade. This contact and trade was then followed by the actual migration of eastern groups, with the result of the gradual absorption of La Jolla traits, and eventually, complete submersion by 2,000 B.P. Causes of this migration and the rate at which it occurred are still controversial, nor is it known if the La Jolla peoples were gradually assimilated or themselves migrated into Baja California.

It is generally accepted that these new eastern groups were the ancestors of the historically known Luiseno and Kumeyaay tribes. The Shoshonean-speaking Luiseno peoples occupied the northern portion of San Diego County at the time of contact, while the Kumeyaay (or Diegueno), a Yuman-speaking group, occupied the south. Kroeber (1925) places the dividing line at approximately the level of Escondido, but more recent researchers (Heizer and Whipple, 1971; Luomala, 1978) would place the line slightly farther north. There were probably slight fluctuations through time, but archaeologically this boundary seems to have been fairly constant.

In the northern part of the county, the archaeological phase representing the ethnographically recorded Luiseno seems to be Meighan's (1954) San Luis Rey II complex, and possibly also the San Luis Rey I. The major defining characteristics of the San Luis Rey I phase include small pressure-flaked projectile points, manos, portable metates, olivella beads, drilled stone ornaments, mortars, and pestles. The dead were cremated. The San Luis Rey II phase differs only in the addition of pottery, pictographs, and (later) historic materials.

By 2,000 B.P., a non-ceramic Yuman Horizon appears at certain La Jolla sites along the Pacific Coast, where according to Moriarty (1966), stratigraphic evidence suggests a cultural continuum between the La Jolla and Yuman traditions. The close relationship between these two traditions is similarly proposed by Warren, who states:

The Yuman tradition appears to have adapted to the same range of ecological zones as the earlier Encinitas Tradition. However, the methods and techniques of food production were somewhat different. The presence of the bow and arrow and the knowledge of how to process acorns, for example, apparently allowed for a more extensive exploitation within this range of ecological zones. This increase in



food production made possible and perhaps stimulated a cultural florescence that was not found in the earlier Encinitas Tradition (1968:10).

The inland pre-ceramic phase is represented sporadically by sites around the Peninsular Range, while the coastal region contains higher densities, perhaps because it has been more extensively investigated.

Archaeological evidence indicates a more variable artifact assemblage including new additions and different frequency distributions. Importation of desert lithic materials resulted in an increased diversity of pressure-flaked artifacts, especially projectile points and blades, many of which are considered diagnostic both temporally and spatially. The grinding technology significantly changed from the portable forms of metate and mano to grinding loci or stations placed on permanent bedrock outcrops and an increased proportion of deep basins and mortars. Burial patterns also change as inhumation in segregated cemeteries is replaced by cremation.

Although the new Yuman populations adapted to essentially the same ecological zones as the La Jolla, a different subsistence strategy evolved with corresponding modifications in the settlement pattern. Sites are now located closer to permanent watercourses with established villages and longer occupancy campsites in the oak woodland valleys and catchment basins along the Pacific littoral and Peninsular Range. An extractive economy centered around acorn resources and hunting is implied. Special resource extractive sites are found clustering around the larger, more permanent sites in an optimizing manner in secondary hunting and gathering zones. Seasonal transhumance and territoriality is also assumed, organized around lineages. This was a time of increasing social and economic specialization and solidification producing the basal tradition which continued until contact and ethnographic recordation.

Some time prior to the introduction of ceramics, a Shoshonean intrusion from the northeast, eventually reaching coastal northern San Diego County, occurred. The exact chronological sequence for this migration/invasion is as yet unknown. Kroeber has suggested that the Shoshoneans of California do not represent a single migration, but rather a succession of local waves (Kroeber, 1925:578-580). Kowta (1969:50) hypothesizes a date of around 3,000 B.P. for the first appearance of Shoshonean speakers in the Los Angeles basin, although 2,000 B.P. is generally accepted as the date for the complete and finalized intrusion which resulted in the division of the Chumash and Kumeyaay, both Hokan speakers. In northern San Diego County, they seem to have adjusted easily to the ecological zones of the Peninsular Range, borrowing from the Kumeyaay to the south. These groups are



represented by the aforementioned San Luis Rey phases as described by Meighan (1954) and illustrate the adaptation to the inland areas as opposed to the northern groups in Orange and Los Angeles Counties which have a more maritime-centered focus (Warren, 1968:8).

The ceramic Yuman phase is represented by numerous sites, both coastal and inland. Inland sites are considered part of the Cuyamaca phase and are found to be similar to San Luis Rey II sites in many respects. Yet True (1966, 1970) has noted several differences between these phases upon which he hypothesizes the existence of two separate cultural traditions related to the cultural developments of these linguistically distinct groups.

The following traits or elements are suggested as typical for the Cuyamaca complex are are (sic) those elements that set the Cuyamaca complex apart from the San Luis Rey complexes in spite of a number of shared traits:

- (1) Defined cemetery areas apart from living areas;
- (2) Use of grave markers;
- (3) Cremations placed in urns;
- (4) Use of specially made mortuary offerings such as miniature vessels, miniature shaft straighteners, elaborate projectile points, etc.;
- (5) Cultural preference for side-notched projectile points;
- (6) Substantial numbers of scrapers, scraper planes, etc., in inventory in contrast to small numbers in San Luis Rey area on this time plane;
- (7) Emphasis and stress placed on use of ceramics. Wide range of forms and several specialized ceramic items such as rattles, bow pipes, effigy forms, etc.;
- (8) Steatite industry;
- (9) Substantially higher frequency of milling stone elements when compared to San Luis Rey;
- (10) Clay lined hearths. (?) (True, 1970:53-54).

The ceramic technology, in all probability, diffused from the Southwest (Arizona-New Mexico area), where knowledge of its manufacture existed prior to its appearance and subsequent utilization in the San Diego area. With the production of pottery, increased storage and preservation of foodstuffs was possible. Greater quantities of vegetables, seeds, acorns, and meat could be exploited at one time in a given region and stored at more permanent locations supporting greater population densities. Seasonal village sites grew larger and small caretaker groups resided year-round as the protection of stored staples became important.



Although primarily an extractive economy, the Kumeyaay are also hypothesized to have practiced an elementary form of agriculture prior to Hispanic contact (Treganza, 1947; Lewis, 1973; Shipek, various communications). This purportedly involved broadcasting seeds of maize, squash and beans on fertile alluvial plains and floodbasins with significant subsurface water. Harvest occurred in early fall and was stored for the winter months.

The Hispanic intrusion, 1769-1822, disrupted many of the coastal Kumeyaay groups and those of the immediate inland river valleys. Subsequent missionization was the beginning of the eventual destruction of the highly evolved socio-cultural system which saw continued displacement of the population under the Mexican land grant program and American gold rush and statehood period.

### Previous Research

Professional and avocational investigations conducted over the past sixty years have resulted in the identification of several hundred archaeological sites both on and adjacent to lands administered by the BLM. The Class I Overview of the Prehistory and History of Inland San Diego County, prepared by Wirth Associates, Inc (1978), provides a comprehensive review of these investigations, specifying individuals and groups who conducted the research and their research interests; information is also provided on areas surveyed, survey techniques, and the number of sites identified. Site records resulting from these investigations were obtained from the BLM, the Regional Office of the State Historic Preservation Office (SHPO) at San Diego State University's Cultural Resource Management Center, and the San Diego Museum of Man. Records consist of site record forms and site locations plotted on U.S.G.S. topographic quadrangles. For this investigation, the records were compiled for the ten U.S.G.S. 7.5 minute quadrangles that encompass the study area, including: Ranchita, Julian, Monument Peak, Mount Laguna, Agua Caliente Springs, Sombrero Peak, Live Oak Springs, Sweeney Pass, Jacumba, and In-Ko-Pah Gorge.

The general purpose of the compilation was to develop baseline data which could be compared to the results of the probabilistic sample. Certain areas -- summits of the Laguna and Cuyamaca Mountains, and portions of the Salton Basin -- were excluded from examination because their physiographic and biotic settings were not comparable to those encountered in the study area. Another, more specific goal of the compilation was to assess formal characteristics of recorded sites to determine temporal phase and functional type, ultimately seeking associations between the site types and environmental variables. The record file was also examined to determine if site types occur in the region which were not encountered during the probabilistic survey.



To accomplish these goals, site records were screened for missing or inconsistent descriptions; those considered complete and reliable were included in the data file. Sites excluded from the compilation were isolates, historic sites, and those with insufficient or ambiguous data. The vast majority of site records were capable of being encoded with respect to formal attributes, however descriptions of environmental characteristics were usually too general for this purpose. Therefore, only section, ownership (BLM, non-BLM), and gross landform (mountain, mountain valley, desert valley, and canyon) were encoded.

The following individuals and groups have conducted investigations within the study area, resulting in the identification of large blocks of archaeological sites. Many individuals and groups who have conducted surveys and tests in the area are not listed below, because their results are not adequately documented for the present purposes, or their records were not available at local institutions.

Ronald V. May. One of the most complete contributions to site documentation of a definable area is the ongoing investigation at Table Mountain by May. The Table Mountain project, conducted for several years in conjunction with the San Diego County Archaeological Society, has focused upon intensive survey of the six lower sections of BLM lands within the Table Mountain section. His initial analysis of this sample (May, 1978b) provides a diachronic model of settlement patterning for this important geologic resource area.

Kenneth E. Hedges, Margaret Morin. These investigators conducted extensive locational surveys in the Canebrake valley system, focusing on the mountain-valley floor interface in a 100-150 meter swatch. Most of the valley border was covered in this effort.

Anza-Borrego Desert State Park. Locational surveys have been an ongoing project throughout the park for over twenty years, starting with William J. Wallace's surveys of Bow Willow Canyon and Indian Valley in the late 1950's (Wallace, 1962). Wallace's group also conducted some site testing at a large site at the head of Bow Willow Canyon. Other surveys have been conducted by Robert S. Begole in the southern section of the park, with emphasis upon Paleo-Indian (San Dieguito) features (Begole, 1973, 1976). Staff archaeologists have continued studies within the park, including a recent probabilistic sample of the northern sections (in progress).

Wirth Associates. This organization has conducted several investigations in the study area, predominantly intensive linear surveys for transmission line corridors including the Sundesert project and the A.P.S. inter-connect.



Richard A. Weaver. Following Wells' (1977) methodology and results, Weaver conducted probabilistic areal sampling in the Carrizo Gorge area for Sundesert transmission line corridor studies (Weaver, 1976).

The following individuals conducted investigations on lands adjacent to those administered by the BLM during various phases of work for environmental impacts assessment. Sites identified during these investigations were assessed for inclusion in the data file.

Paul Chace surveyed 524 acres at the upper end of Walker Canyon, recording 14 sites.

Sue Ann Cupples conducted several small surveys in and around McCain Valley for local Indian reservations and a private development. The reservation surveys were of specific housing lots and recorded no sites; two small scatters were recorded for the 23-acre intensively surveyed private lot.

Leslie Eckhardt intensively surveyed 160 acres in Montezuma Valley, recording nine sites.

Gary Fink, under the auspices of the County of San Diego Department of Transportation, conducted linear surveys for road alignments in the study area.

Scott Fulmer surveyed 158 acres within Jewell Valley, recording five sites.

Melissa Johnson recently supervised a 2000-acre survey of upper Table Creek in McCain Valley; twenty-nine sites were identified.



### 3.2 Methodology

The methods of inventory and analysis used for this study are discussed under the general headings Sample Design, Field Methods, and Analytical Approach.

#### Sample Design

A phased systematic sample inventory, consisting of a stratified random sample with supplementary purposive coverage of selected areas was performed to provide a data base for analysis. As the area encompasses a range of physiographic and biologic zones, the sampling universe was stratified to control spatial distribution of transects and to refine density estimates. Sample transects were drawn within the parameters of a random sample, since this assumption is basic to many of the statistical methods applied during analysis. Selection of the sample was undertaken in stages, so adjustments to the internal proportions could be made based upon initial results.

The rationale for these procedures and methods of accomplishment were outlined by BLM at the outset; specific constraints included:

1. Field survey shall consist of an intensive examination of seven thousand (7,000) acres of land administered by BLM.
2. A probabilistic (random or systematic) sampling scheme shall be used. The sampling scheme may consist of one or more stages. Various stages may involve stratifying the sample, increasing the sample of select strata, restratifying select portions of the sampling universe, judgmental selection of additional sampling units, and/or integration of judgmental reconnaissance or unsystematic survey into the sampling scheme.
3. The study area shall be divided into sample units of comparable size. The total number of sample units within the study area shall constitute the sampling universe. The sample units shall conform to the existing cadastral grid and shall be structured as either square or rectangular quadrants. Sample units shall be confined to land administered by the Bureau of Land Management unless prior agreement has been made with other agencies or private landowners.

The initial stratification of the McCain Valley Study Area was defined by BLM land ownership, constituting a 98,000-acre sample universe. Because these lands are largely non-contiguous, the total area was subdivided into seven study sections: San



Ysidro Mountains, San Felipe Hills, Banner/Julian, Oriflamme, Vallecito-Canebrake, McCain Valley, and Table Mountain. Throughout the following sections, the sections are sometimes referred to as regional strata, as they are considered variables for analysis. Within each section, the area was further stratified according to general landform characteristics: mountain, mountain valley, desert valley, and canyon; these strata were scaled by relief, elevation, and vegetative characteristics by the BLM for use in their overall planning efforts.

The basic unit of analysis was a 1/4 by 1/2 mile transect, encompassing one half of a quarter-section. Selection of this size and shape unit was prompted by the need for cadastrally oriented units, comparable in size to those used in previous studies, that minimized the likelihood of crosscutting strata, and maximized survey efficiency in terms of access, identification, and coverage. Transects could assume any of four orientations (e.g. north, south, east or west half of a quarter-section), which was selected randomly to eliminate sample bias. Although the cadastral grid is not always regular, the area of the transect (80 acres) was held constant and centered appropriately where necessary.

Quarter-sections within the entire study area were consecutively numbered west to east, starting with the northwest quarter-section and ending with the southeast. Those not wholly encompassed by BLM ownership were eliminated from the random sample (but were later included in the judgmentally selected Stage III sample) changing the sampling universe downward to 517 quarter-sections, or 82,720 acres. The proportional area of each of the seven sample sections, and of the four possible strata within, was computed by quarter-section using a 51% rule in the event of crosscutting strata (see Table 1).

The first stage sample was arbitrarily fixed at one half the minimum total sample size, or approximately 3,500 acres (44 transects). The goal of this stage was to generate base frequency estimates for the strata in each of the study sections. The sample was drawn such that each stratum -- mountain, mountain valley, desert valley, canyon -- in every study section was covered in proportion to its areal size relative to the total universe. Consecutive transects were drawn using an interval constant following a random seed. The composition of this sample is described in Table 2.

For the second stage, the sample design was modified based upon first stage results. The highest densities of complex sites (e.g., temporary camps and large scatters) were recorded in mountain valley, desert valley, and canyon strata in the Vallecito/Canebrake, McCain Valley, and Table Mountain sections. Five mountain transects could not be field surveyed and four received only partial coverage because of problems of access,



terrain, or vegetal cover. Because the success rate for completing randomly selected transects in the mountain stratum was lowest of the four, and because complex sites were lacking in these areas, the mountain stratum was eliminated from the remaining portion of the random sample, with the exception of the Table Mountain section, a unit not comparable to other mountain stratum in physiography or site density. Thus, the Stage II sample was limited to Vallecito/Canebrake, McCain Valley (valley and canyon strata), and Table Mountain. The sample size was set at half that of the first stage (22 transects) plus the number of transects that were considered unsurveyable or received less than 50% coverage (6 transects) during the first stage, resulting in a stratified (proportional) random sample of 28 transects; two additional transects were added to this total due to errors in map reading in the field during Stage I; for a total of 2400 acres. This stage sample, described in Table 3, completed the probabilistic sample set.

For Stage III, the sample universe included any area within the BLM lands that had not been covered during earlier stages; 22 transects were selected purposefully. Selection of transects in the northern study sections (San Ysidro Mountains, San Felipe Hills, Banner/Julian, Oriflamme) made coverage of these sections proportionate to that in the other sections. Features of special interest with a low probability of being included in the survey using random selection procedures were also covered (e.g., Vallecitos Marsh, Walker Canyon, Jacumba). During this stage, twenty-one transects were completed (1680 acres; one was eliminated due to terrain and brush cover), bringing the sample total to 90 transects (7200 acres), thus meeting the required minimum sample size of 7000 acres. The distribution of transects by region and strata for Stage III is given in Table 4.

Stage I sampling provides a proportional random sample for the entire universe. Stage II augments the size of the sample for areas of greater interest, such as mountain and desert valleys and Table Mountain. Stage III fulfilled the minimum areal sample requirement through purposive selection of areas impractical to survey probabilistically. For statistical testing, only the first two stages are used; but Stage III data is presented to clarify results.

### Field Methods

Field survey coverage of the 7200-acre sample was conducted in three stages during May and June, 1979. The basic survey unit was a 1/4 by 1/2 mile transect. Transect and site records were kept for sites and their attributes, as well as environmental elements such as vegetation, landform, and proximity of water sources. Samples of ceramics, flaked lithic artifacts, and obsidian were collected for specific analytical purposes. The field survey included 230 work days, conducted during one two-week and two one-week sessions.



TABLE 1

## Area Calculations by Study Section and Landform Strata

|                     | <u>Sample<br/>Sections</u> | <u>Sample<br/>Area</u> | <u>Estimated<br/>Total Area</u> |
|---------------------|----------------------------|------------------------|---------------------------------|
| San Ysidro Mountain | 13                         | 2,080                  | 2,600                           |
| Mountain            | 13                         | 2,080                  |                                 |
| Desert Valley       | 1                          | 0                      |                                 |
| Canyon              | 1                          | 0                      |                                 |
| San Felipe Hills    | 24                         | 3,840                  | 5,040                           |
| Mountain            | 23                         | 3,760                  |                                 |
| Desert Valley       | 1                          | 0                      |                                 |
| Canyon              |                            | 80                     |                                 |
| Banner-Julian       | 22                         | 3,520                  | 5,960                           |
| Mountain            | 21                         | 3,440                  |                                 |
| Desert Valley       | 1                          | 80                     |                                 |
| Canyon              | 1                          | 0                      |                                 |
| Oriflamme           | 23                         | 3,680                  | 4,400                           |
| Mountain            | 22                         | 3,600                  |                                 |
| Desert Valley       | 1                          | 80                     |                                 |
| Vallecito-Canebrake | 201                        | 31,840                 | 4,400                           |
| Mountain            | 140                        | 22,080                 |                                 |
| Desert Valley       | 61                         | 9,760                  |                                 |
| McCain Valley       | 197                        | 32,840                 | 39,440                          |
| Mountain            | 105                        | 16,800                 |                                 |
| Mountain Valley     | 80                         | 12,800                 |                                 |
| Desert Valley       | 8                          | 1,280                  |                                 |
| Canyon              | 2                          | 320                    |                                 |
| Table Mountain      | 37                         | 5,920                  | 7,320                           |
| Mountain            | 36                         | 5,760                  |                                 |
| Mountain Valley     | 1                          | 160                    |                                 |



TABLE 2

Distribution of Transects by Region and Strata - Stage I

| <u>REGION</u>       | <u>STRATA</u>   |                        |                      |               | <u>Total</u> |
|---------------------|-----------------|------------------------|----------------------|---------------|--------------|
|                     | <u>Mountain</u> | <u>Mountain Valley</u> | <u>Desert Valley</u> | <u>Canyon</u> |              |
| San Ysidro Mtn.     | 1               | 0                      | 0                    | 0             | 1            |
| San Felipe Hills    | 2               | 0                      | 0                    | 0             | 2            |
| Banner-Julian       | 2(1)*           | 0                      | 0                    | 0             | 2(1)*        |
| Oriflamme           | 1(1)*           | 0                      | 0                    | 0             | 1(1)*        |
| Vallecito-Canebrake | 8(2)*           | 0                      | 5                    | 0             | 13(2)*       |
| McCain Valley       | 7(1)*           | 9                      | 0                    | 1             | 17(1)*       |
| Table Mountain      | 3               | 0                      | 0                    | 0             | 3            |
| TOTAL               | 24(5)*          | 9                      | 5                    | 1             | 39(5)*       |

\*( ) Not surveyed

TABLE 3

Distribution of Transects by Region and Strata - Stage II

| <u>REGION</u>       | <u>STRATA</u>   |                        |                      |               | <u>Total</u> |
|---------------------|-----------------|------------------------|----------------------|---------------|--------------|
|                     | <u>Mountain</u> | <u>Mountain Valley</u> | <u>Desert Valley</u> | <u>Canyon</u> |              |
| San Ysidro Mtn.     | 0               | 0                      | 0                    | 0             | 0            |
| San Felipe Hills    | 0               | 0                      | 0                    | 0             | 0            |
| Banner-Julian       | 0               | 0                      | 0                    | 0             | 0            |
| Oriflamme           | 0               | 0                      | 0                    | 0             | 0            |
| Vallecito-Canebrake | 0               | 0                      | 11                   | 0             | 11           |
| McCain Valley       | 0               | 12                     | 0                    | 3             | 15           |
| Table Mountain      | 4               | 0                      | 0                    | 0             | 4            |
| TOTAL               | 4               | 12                     | 11                   | 3             | 30           |



TABLE 4

## Distribution of Transects by Region and Strata - Stage III

| <u>REGION</u>       | <u>STRATA</u>   |                        |                      |               |              |
|---------------------|-----------------|------------------------|----------------------|---------------|--------------|
|                     | <u>Mountain</u> | <u>Mountain Valley</u> | <u>Desert Valley</u> | <u>Canyon</u> | <u>Total</u> |
| San Ysidro Mtn.     | 1               | 0                      | 0                    | 1             | 1            |
| San Felipe Hills    | 2               | 0                      | 0                    | 1             | 3            |
| Banner-Julian       | 1               | 0                      | 1                    | 1             | 3            |
| Oriflamme           | 0 (1) *         | 0                      | 3                    | 0             | 3 (1) *      |
| Vallecito-Canebrake | 1               | 0                      | 4                    | 0             | 5            |
| McCain Valley       | 1               | 2                      | 1                    | 0             | 4            |
| Table Mountain      | 2               | 0                      | 0                    | 0             | 2            |
| TOTAL               | 8               | 2                      | 9                    | 2             | 21 (1) *     |

\* ( ) Not surveyed



A significant amount of time was spent locating and traveling to survey areas. This was especially true in mountainous locales where terrain was most difficult and access roads the least frequent. Two transects were eliminated from the first stage sample because of problems of access (during Stage II two additional transects were surveyed as substitutes for the two eliminated in Stage I). Whenever possible, mapped landmarks and man-made features were used to locate transects, but pascings along compass bearings and topographic readings were necessary in many instances. Two transects were mistakenly surveyed due to inaccurate map reading (correct areas were subsequently surveyed).

Survey conditions were generally good, with fairly open ground cover, except in the northern mountains (San Ysidro Mountains and Banner/Julian sections) and along the western edge of McCain Valley where dense chaparral was encountered. The ruggedness of terrain and the dense brush cover resulted in the elimination or only partial coverage of eight transects, and was a major rationale for selecting Stage III transects in the northern study sections. In the mountain areas slopes of 50-100% were common, creating difficult survey conditions, but because of the under-representation of these areas in previous surveys, every effort was made to sample this more difficult terrain.

Each transect was covered by a crew of four, composed of three crew members and a crew chief; the crew chiefs were responsible for overall documentation and quality control. The transects were walked in two sweeps at fifty-meter intervals, a procedure which conforms with coverage techniques used for previous BLM studies. Though transect intervals were maintained as closely as possible, slope, brush cover, and large rock outcrops, as well as inevitable human errors, caused some variance in procedure. When necessary, portions of transects were resurveyed, and areas not surveyed were identified in the transect records.

Site boundaries were defined on the basis of topography and a fifty-meter artifact interval rule, corresponding to a theoretical reduction in density to less than .0001/m. In some areas, especially the eastern edge of McCain Valley, and Table Mountain, the density of isolated flakes or sherds appeared to be higher than this arbitrary figure, and the density value was adjusted. Sites were initially classified under BLM codes, with emphasis of site description on estimating the range of artifact types, variability within these categories, and the overall density of materials. Because of time limitations, precise densities of artifact categories could not be taken, but were estimated as closely and consistently as possible.

Certain materials, including ceramics, distinctive or diagnostic chipped stone artifacts, and obsidian were collected



at the request of the Contracting Officer's Authorized Representative (C.O.A.R.). A sample of the range of ceramic types at large sites was collected to allow more detailed identifications to be made. Samples of obsidian were collected and submitted to UCLA for hydration analysis. Although diagnostic chipped stone artifacts were collected, the occurrence of such items was unusually low; only five projectile points were collected from 254 sites. All collected materials were provenienced, and datum stakes placed where collections were taken. Through prior agreement, the materials will be curated at the Imperial Valley College Museum, El Centro, California.

Written and photographic documentation for all transects and sites was compiled in the field, using site record forms developed for the project and transect forms provided by the BLM. Field observations and descriptions of topography, vegetation, geology, and hydrology within each transect, as well as details of survey procedures and summaries of site attributes, were recorded on the transect forms. To document formal variability, site record forms were drafted to insure consistency among recorders. Estimation of the distribution and variability of ceramic sherds and waste lithics was emphasized. Field records were transferred to the BLM Cultural Resource Inventory Record (CRIR) forms and California Parks and Recreation record forms; these were respectively submitted to BLM, San Diego State University, the regional clearinghouse for both the Society for California Archaeology (SCA) and the Regional Office for the State Historic Preservation Office (SHPO).

#### Analytical Approach

The probabilistic random sample was drawn to provide a basis for approximations of site frequency and distribution. Analysis of this sample assesses formal, temporal, regional, and environmental variability for prehistoric sites identified from surface survey data. Previously recorded site data were also compiled, but analyzed separately, to augment the assessments of formal and temporal variability and the estimates of regional site type distributions. The results provide: (1) an assessment of the range of occupational phases, and morphological or functional variability within and between sites, (2) regional density estimates at stated confidence intervals and less formal point estimates, and (3) evaluations of the effectiveness of using various gross environmental factors as discriminants of site type distributions. The analyses were conducted on the assumption that sites were situated purposefully in space and time in relation to the distribution of cultural and natural features and critical or frequently exploited resources (cf. Jochim, 1976; Plog and Hill, 1971; Weide, 1973; Euler and Gummerman, 1978).



Two modes of analysis were used: transect or areal analysis, which controls for site distribution by areas sampled, is used for estimating site densities and can also be used to determine conditions which influence the absence of sites. Site specific analysis controls for the distribution of sites by environmental characteristics, and is used to assess cultural and environmental variability within and between site types. Data for both modes came from direct field observations; in addition, scalings of environmental characteristics, such as landform, geology, hydrology, and vegetation, were compiled from base maps. Three separate data files were compiled: (1) transect data, which includes environmental characteristics and site types recorded within each sampled area; (2) site specific data which includes environmental features (measured from point locations rather than over areas) and detailed breakdowns of features and artifacts for each site locus; and (3) previously recorded site data, which includes less quantified artifact tabulations and only gross regional and landform characteristics. As an aid to understanding the analysis and results, a brief description of sources and scaling procedures follows.

Cultural data were encoded for all three files. For transect data, only the number of sites and number of sites within each type class was encoded. For both the survey sample and previously recorded site data, qualitatively scaled listings of artifact and ecofact components were encoded, such as the presence or absence of midden, flaked lithics, milling features, roasting pits, and ceramics, as well as morphologically distinct artifact forms such as scrapers, cores, buffwares, mortars, and metates. A summary measure of the components at each site was scaled to estimate relative complexity between and within sites and types. In addition, areal size and flaked lithic and ceramic waste densities were estimated: exponential intervals were used (i.e.  $10^1$ ,  $10^2$ ,  $10^3$  . . . ); for the existing record the exponential estimates were only used for site area. The densities of flaked lithics and ceramics were compressed into three classes ( $10^1$ ; up to  $10^3$ ; and above). Existing records with ambiguous or insufficient data were eliminated, as were isolates.

Regional data were also encoded for all three files, including section, transect number, sample strata, and specific substrata (e.g. Canebrake/mountain). From the existing record only gross landform (e.g. mountain, desert valley, canyon), region (e.g. Carrizo Wash, Tule Creek-McCain), and the U.S.G.S. 7.5 minute quadrangle were encoded. If a previously recorded site fell within one of the sections or transects, or was re-recorded during the survey, a notation was entered to prevent redundancy.

Use of environmental data was restricted to the sample transect and site files. Existing site records could not be comparably scaled due to restricted areal coverage on several



of the base maps, and because environmental variables were not sufficiently described on site record forms.

Several measures were used for landform. The initial sample landform strata (mountain, mountain valley, desert valley, canyon) were used for all files based upon a Unit Resources Analysis (URA) map prepared by BLM. The average slope of the transect, or predominant and secondary values if a major change occurred, was scaled for the transect file from U.S.G.S. 7.5 minute quadrangles. For sites, the average slope at each location, measured along a line 500 feet above and below the point location, was used. Two areal landform measures for 40-acre and 1-mile areas around the site were also recorded, adopted from SARG (Plog et al., 1978: Figure 1). By recording changes in elevation between the site and four equidistant points, Hammond landform classifications such as flat, base of slope, canyon, knoll, and ridge were defined.

Geologic formations associated with sites and transects were taken from State of California geologic maps of the area (San Diego and El Centro Sheets) which display nine categories for the sample areas, including five granitic-batholith formations, two quaternary alluvial formations, meta-sedimentary formations, and Miocene volcanic units.

Vegetal data combined field observations of plant genera at each site and within transects, and information derived from a BLM URA (Step II) map of general communities. These data could not be applied to existing site records outside BLM lands due to restricted areal display on the maps. A more detailed 60 community range-graze map emphasizing grass and herb compositions had been prepared by BLM, but was found to be too detailed for use here.

Hydrology was scaled using the Strahler (1964) method of stream ranking, measuring the distance in kilometers from transect centers and sites to Rank I and Rank II or higher streams, springs, and seeps. Sample files also included observations of the presence or absence of surface water, and the source type. This ranking system allows for the changing availability of surface water in a transitional and seismically active area (Bean, 1972:33). Drainage morphology might be a more reasonable indicator of water availability over time since currently dry features may have been more active in the past.

The analysis used sample data to set density approximations for all regional and environmental categories. The initial task was the formulation of an explicit and consistent site classification system that segregated the sample into homogeneous classes. A series of descriptive type classes was defined based on the distribution of specific artifact components and aggregates (flaked lithics, ceramics, milling), features (roasting pits, rockshelters, rock walls or circles),



and artifact densities as they varied within the sample. Modifications of the existing BLM type classification system were necessary as it does not explicitly define or control for the possible range of material components occurring within each class. For example, the BLM Type 2-Temporary Camp category is defined as

a catch-all category. It includes sites that include a range of artifacts and/or cultural features that in combination do not allow the site to be typed in another category (e.g., pottery with flakes) . . . an open site with any combination of flaked stone artifacts, groundstone, fire affected rock and/or ceramics could fit in this type.

In practice, such diverse features as roasting pits with milling, lithic/ceramic scatters, and milling features with associated artifacts would be combined under one class. While this ultimately may be appropriate, it is in effect hypothetical, and must be demonstrated through analysis, which is a general purpose for conducting this study. More descriptive, monotypic classes were used, therefore, and more interpretive reclassifications are suggested from analysis. Reclassification of ASM site types under various interpretive, polytypic criteria is facilitated by their componential structure; but the reverse procedure, as would be necessary if BLM criteria were used for analysis, would be difficult or in some cases impossible.

Multiples or clusters of sites were recorded separately in several transects; an arbitrarily defined density rule was used to delineate site boundaries. In some cases these distinctions may have been appropriate, as the loci were likely independent, but in others the separation may only express minor vagaries of terrain, or recording error, unduly weighting the importance of a given setting. In practice not all these effects could be satisfactorily controlled, so both site-specific data and transect data were used in the analysis.

While in the general sense we may assume that the sample of sites is random, this assumption should be qualified. As Read notes,

by its very nature, dividing a region into quadrants clusters sites . . . hence regional sampling is, perforce, cluster sampling if the site is the element of interest (Mueller (1975:54)).

Statistical techniques for testing clustered data are not developed to the extent of point samples (Thomas, in Mueller 1975:80). Due to the exploratory nature of this study, various tests based upon independent selection, such as chi-square, were applied to the site data; but the validity of such testing is greater for transect data, as a random sample of transects, rather than sites, was, in fact, selected.



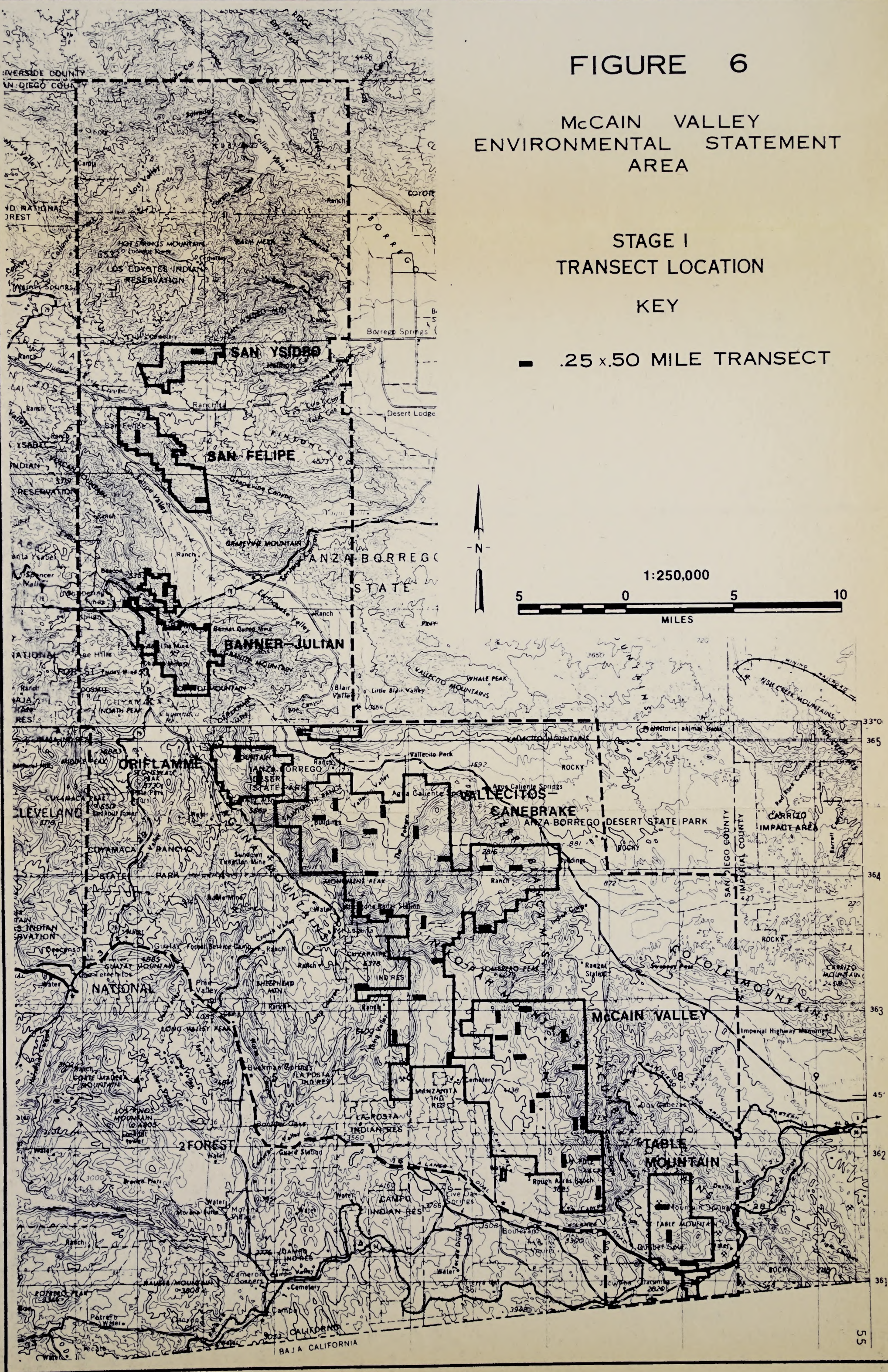
FIGURE 6

McCain Valley  
ENVIRONMENTAL STATEMENT  
AREA

STAGE I  
TRANSECT LOCATION

KEY

— .25 x .50 MILE TRANSECT









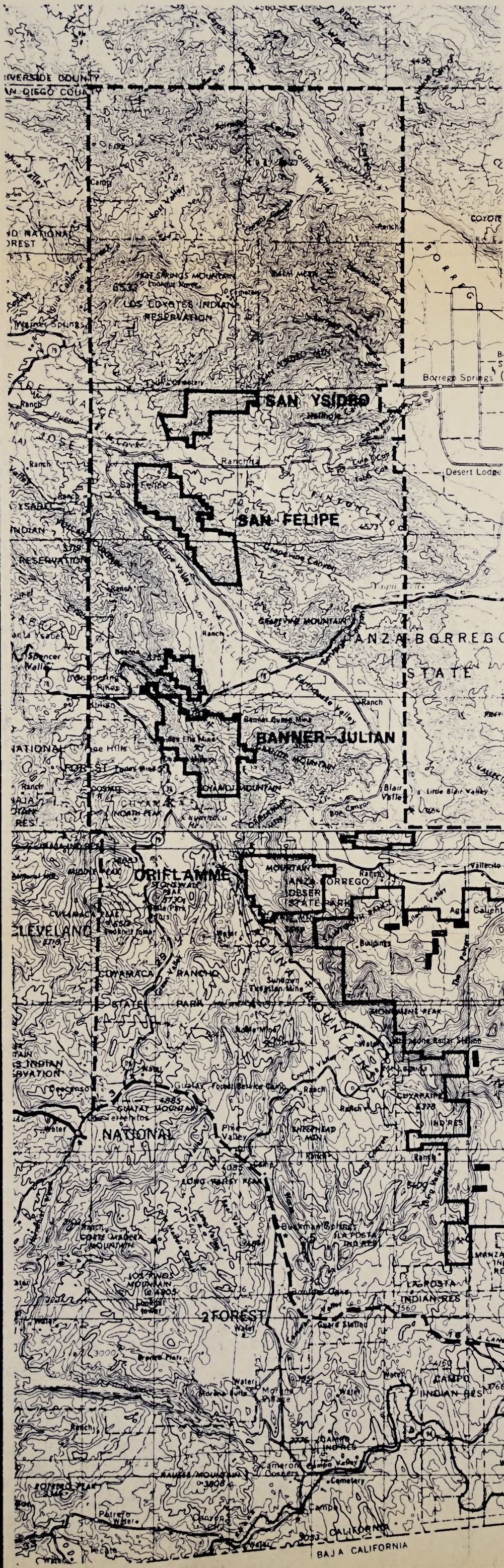


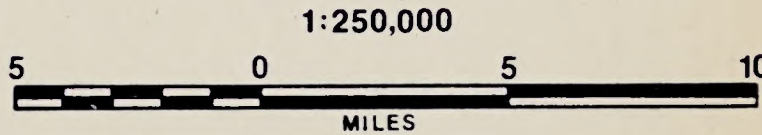
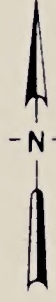
FIGURE 7

McCain Valley  
ENVIRONMENTAL STATEMENT  
AREA

STAGE II  
TRANSECT LOCATION

KEY

— .25 x .50 MILE TRANSECT





УДК 62-50  
ТРИКОМОВСКИЙ  
А.В.

УДК 62-50



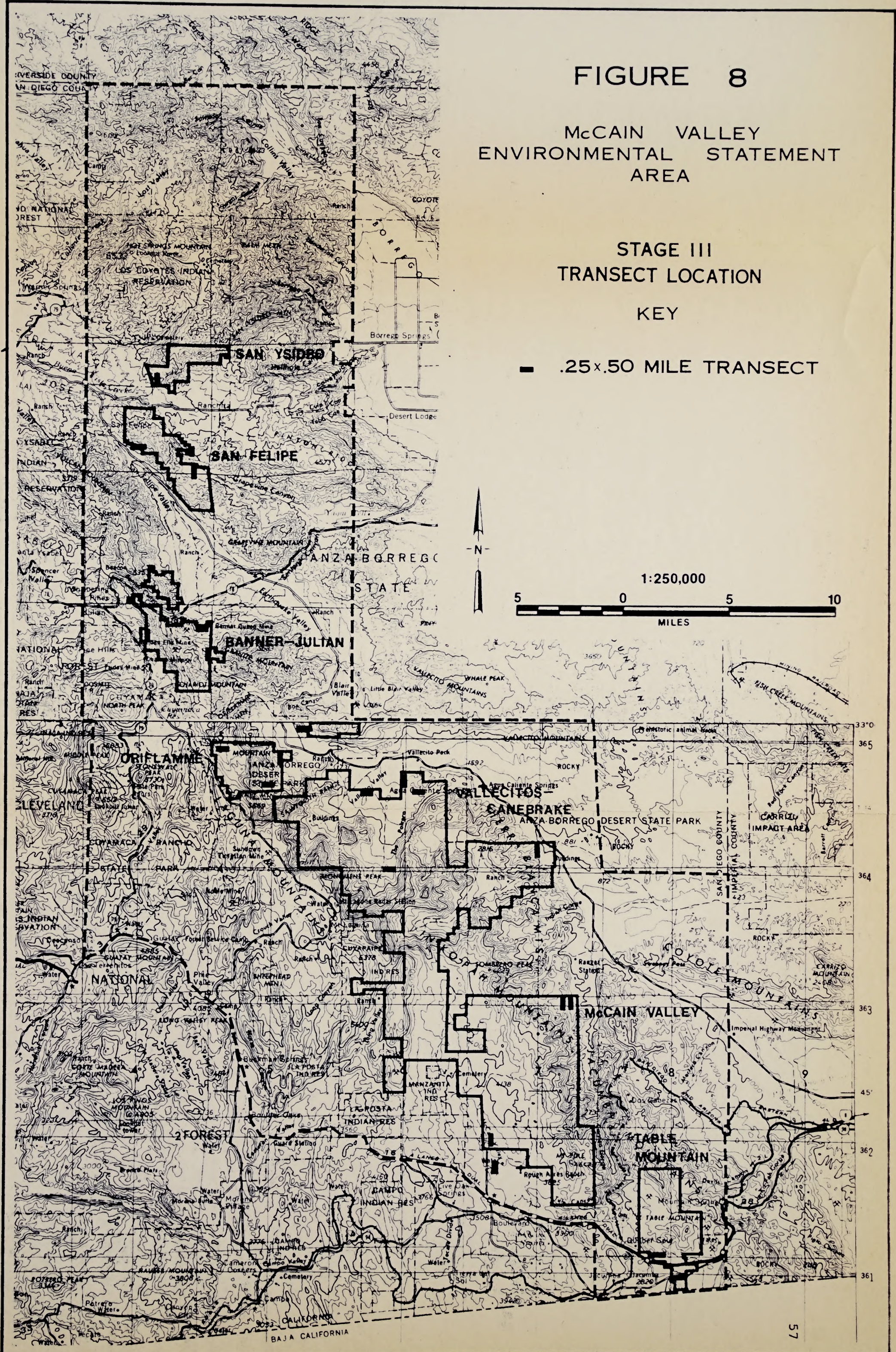
FIGURE 8

McCain Valley  
ENVIRONMENTAL STATEMENT  
AREA

STAGE III  
TRANSECT LOCATION

KEY

■ .25x.50 MILE TRANSECT





WISCONSIN  
UNIVERSITY  
MADISON  
JANUARY 1952

FIGURE 2





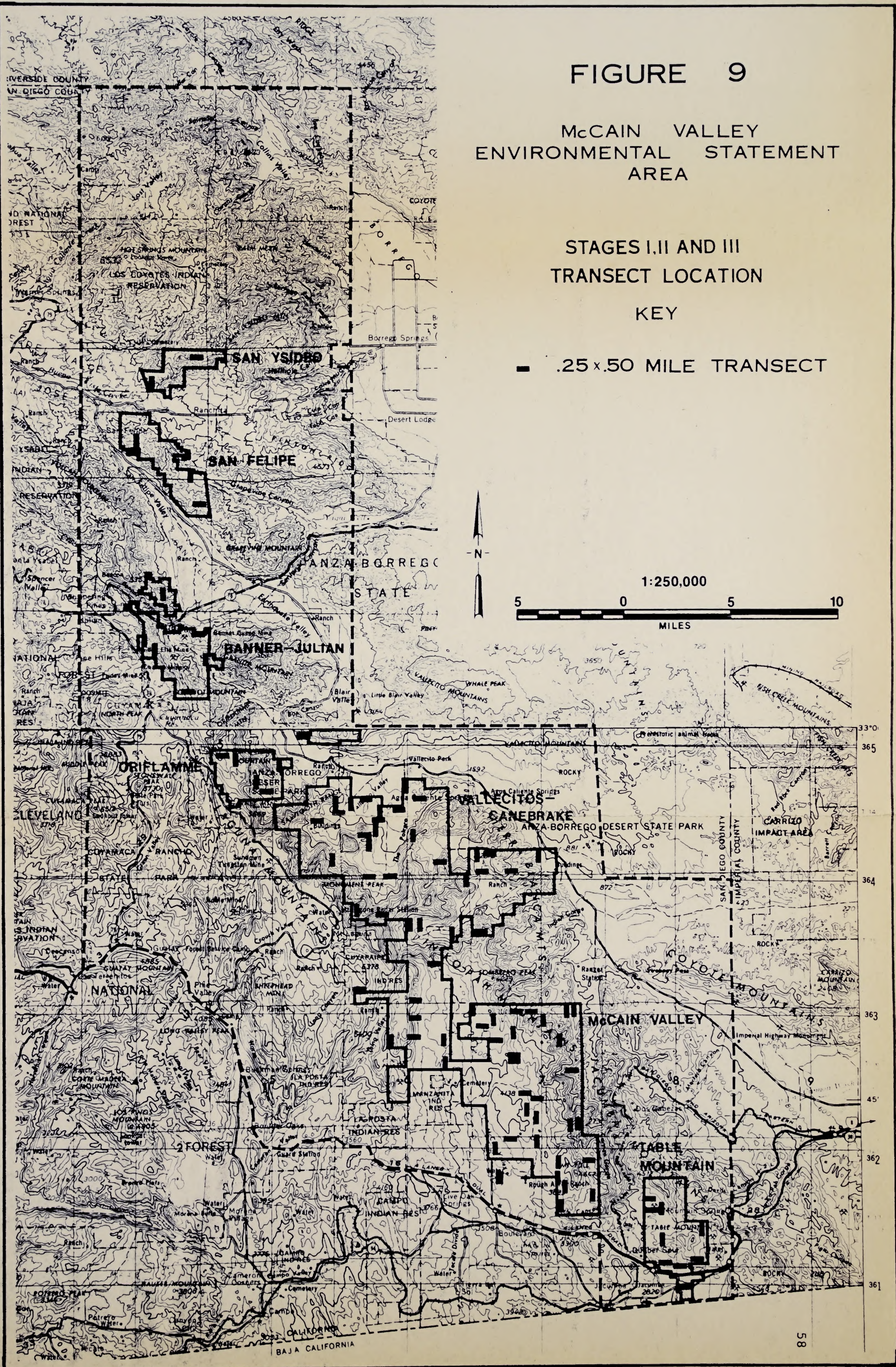
# FIGURE 9

## McCAIN VALLEY ENVIRONMENTAL STATEMENT AREA

### STAGES I, II AND III TRANSECT LOCATION

#### KEY

— .25 x .50 MILE TRANSECT









### 3.3 Analytical Results

#### Analysis of Cultural Variability

##### Temporal Variability

Evidence of temporal (cultural phase) variability within the sample is extremely limited with no clear examples of a preceramic phase of occupation recorded during the survey or subsequent analysis. Recognition of a preceramic phase site -- dating prior to the introduction of ceramics -- from surface indications would require either a distinct assemblage of diagnostic preceramic artifacts or a complex site that under the assumption of a late occupation should, but does not, exhibit ceramics. The absence of ceramics at small features, i.e. cairns, rockshelters, roasting pits, rubs, or lithic scatters -- non-ceramic sites -- without diagnostic artifact types is not sufficient evidence for a preceramic occupation, since the absence may be explained on purely functional grounds.

Temporal phase distinctions may be drawn on criteria other than ceramics since the prehistory of the region follows a long cultural adaptational sequence with major differences in artifact assemblages and settlement pattern distributions. The sample, however, generally lacked morphologically or functionally distinctive chipped stone materials compounding the problem of recognizing cultural traditions or components. One datable class of material, obsidian, was collected and analyzed, but problems of interpreting hydration-band values in this region make the results inconclusive.

San Dieguito features and artifact elements have been reported for the southern part of the study area, including Carrizo Wash and Table Mountain-Jacumba, by Rogers (1966), Begole (1973), and May (1979). Two separate site types occur: cleared circles and lithic scatters exhibiting patinated andesite/felsite flakes and occasionally other artifacts of the San Dieguito tradition. The "sleeping" circle concentration in Carrizo Wash is described as the "greatest concentration of the structures in the entire San Dieguito I domain (at least 364)" (Rogers, 1966:151). Such sites, however, are more numerous to the east and north. The Table Mountain sites are thought to be related to either the quarrying of Table Mountain volcanics (May, 1979) or as camp-sites along Jacumba Pass which Rogers postulated as the "principal corridor for the San Dieguito II migrations from the desert into western San Diego County" (Rogers, 1966:151).

There are no previous records of a preceramic milling-stone tradition for the Laguna Mountains area, although such adaptations are documented for the coastal zone of San Diego (La Jolla-Pauma) and the Mojave and Colorado Deserts (Pinto, Gypsum, Amargosa). Kowta (1969) explains the lack of a post-San Dieguito millingstone tradition in San Bernardino Mountain



desert transitional areas as due to a focus upon agave exploitation as the primary subsistence pattern. During the altithermal, when drought severely reduced agave, this focus became untenable. At the close of the altithermal these areas were repopulated following the reemergence of agave in a moister climate. Weide and Barker (1974) also propose abandonment of the west mesa desert region during this period of arid climatic conditions.

The late prehistoric phase is most heavily represented in the previous records and research, and is the only cultural tradition recognized within the systematic sample. This adaptational configuration probably predated the introduction of ceramics, however, and preceramic components may be present that cannot be recognized. Meighan (1954) has demonstrated a late preceramic component in the San Luis Rey River basin, as has Moriarty (1966) for the coastal zone; in most respects they are similar to the ceramic components. No such component has been defined within the Laguna Mountains, however. It is considered unlikely that this distinction can be made with surface survey data, for site locations, distributions, and material cultures of the late prehistoric prior to and following the introduction of ceramics do not vary significantly; most areas in use prior to ceramics are expected to also have been occupied after their introduction. Therefore, subsurface testing will probably be required to detect any preceramic components.

The introduction of ceramics is dated at around 1000 B.P. (May, 1974; True, 1966). No chronological distinctions can be drawn on the basis of pottery types within the ceramic sequence because different types occur throughout the sequence and are considered to be geographically or culturally distributed. This is true of the plain brown wares indigenous to the mountains and buff wares of the Colorado Desert. The presence of both may be explained by proposing an admixture of peoples.

Wilke (1976) has proposed a relatively significant fluctuation in late prehistoric ceramic phase settlements based on intensive exploitation of Lake Cahuilla. An increase in the occupation of areas such as the eastern slopes of the Laguna Mountains followed desiccation of the lake (A.D. 1400) and the loss of a significant resource base in the Colorado Desert. While this would in part explain the relatively high density of ceramic sites in the area, the lack of chronological control over ceramic types precludes any confirmation of this hypothesis with the survey data.

The lack of known temporal variability within the sample is not surprising. San Dieguito sites are most likely situated around Jacumba and Table Mountain areas due to the presence of a significant lithic resource and the strategic advantage of the pass for transit to coastal areas. That no



San Dieguito sites are in the sample may be a function of sample error due to the limited range and frequency of such sites, and the difficulties inherent in distinguishing between early quarrying activities and limited habitation camps in areas extensively and intensively used by later groups.

That no indications of an early milllingstone tradition were found is also not surprising, but is significant for future theoretical and methodological work in the area. The recognition of such sites is a major problem requiring controlled excavation, since the presence or absence of ceramics on the surface of a site is not a reliable test. Additionally, the lack of diagnostic artifactual forms in the surface components of all sites recorded during the survey renders the likelihood of recognizing San Dieguito or early milling sites extremely low from using standard survey methods. Test excavations of sites and artifact distribution studies within specific areas to distinguish anomalous configurations or settings from the late prehistoric patterns are necessary to identify such an occupational sequence, if it exists.

Since diagnostic artifacts and distinct assemblages were not noted, two sources of data for assessing temporal variability were used: presence of ceramics, and measurements of obsidian hydration-band widths. The distribution of ceramics (presence/absence) by site types is tabulated in Table 5. Certain site types are combined to eliminate tautologous relationships (i.e. lithic scatters with ceramics were separated from lithic scatters without ceramics).

TABLE 5

Presence/Absence of Ceramics by Site Types

|         | Camps<br>(02) | Lithic<br>Scatters<br>(03-07) | Ground-<br>Stone<br>(09,10,21) | Roasting<br>Pits<br>(14,15) | Total | All Sites<br>(02-23) |
|---------|---------------|-------------------------------|--------------------------------|-----------------------------|-------|----------------------|
| Present | 36            | 16                            | 4                              | 5                           | 61    | 99                   |
| Absent  | 0             | 13                            | 14                             | 107                         | 134   | 155                  |
| TOTAL   | 36            | 29                            | 18                             | 112                         | 195   | 254                  |

While only 39% of all sites exhibited ceramics, the majority of sites are roasting pits which are not necessarily associated with ceramics or flaked tools in a functional sense. Eliminating these, 70% of the remaining sites have ceramics. A more specific test for a preceramic component is the distribution of midden and ceramics, for which only four of 24



midden sites did not have ceramics. While these sites may represent preceramic occupation, no diagnostic features were noted and three of the four are quite small and unreliable test cases. Evaluation of temporal (cultural phase) variability on the basis of ceramics suggests late occupation.

Temporal divisions within the ceramic phase have not been made on the basis of type frequency distributions (i.e. seriation). Emphasis, rather, has been placed on scaling geographic distributions for types by surface color, paste/temper, and minor vagaries in firing technique. While some tentative sequences are proposed (cf. Rogers, 1945; May, 1978), insufficient stratigraphically and radiometrically controlled samples have been collected to allow relative dating by type frequency analysis. Ceramic sites are considered broadly contemporaneous.

Obsidian samples were taken at twelve sites during the first and second stage surveys and submitted for hydration analysis at UCLA. Results are inconclusive due to the lack of an accepted band formation rate from Obsidian Butte sources. (This source identification is tentative but considered likely.) For this reason three rates are given in Table 6. The first is close to a rate proposed by Paul Chace (personal communication) for use with Obsidian Butte sources and is the fastest rate proposed; the average California rate and slowest rate are presented for comparison. Following Chace's rate, all samples post-date the inundation of Lake Cahuilla and late prehistoric. In contrast, the average rate would support an inference for occupation prior to the ceramic phase of the late prehistoric, and possibly the earlier Millingstone Horizon. A more complete discussion of the sample, techniques of measurement, and interpretation is presented in Section 3.5.

TABLE 6

Range of Absolute Dates (T) for Sample Hydration Band Widths (X),  
at Various Diffusion Rates (d), where  $T = dx^2$

(Ericson, 1979)

Sample (42 measurements) Mean = 2.65, std. dev. = 1.01

|                         | <u>d</u> | <u>X</u> | <u>1.0</u> | <u>2.0</u> | <u>3.0</u> | <u>4.0</u> | <u>5.5</u> |
|-------------------------|----------|----------|------------|------------|------------|------------|------------|
| Fastest California rate | 35.0     | T =      | 35         | 140        | 315        | 560        | 1021       |
| Average California rate | 160.0    | T =      | 161        | 642        | 1445       | 2570       | 4683       |
| Slowest California rate | 463.3    | T =      | 436        | 1745       | 3927       | 6981       | 12723      |



In subsequent analysis, temporal variability will be eliminated as a source of error and the site sample will be assumed roughly contemporaneous within the late prehistoric context.

### Formal Variability

All sites were classified on the basis of observed variability in the distribution of artifacts, specific features, and site morphology. Three primary artifact "components" (flaked lithics, ceramics, and milling/groundstone) were ordered into all possible individual and aggregate combinations, and further segregated by site size and artifact density. Features such as roasting pits, rock structures, and rockshelters were classed as separate types and subdivided by component distribution. Specific artifacts within a component, or ecofacts, such as shell, or bone, were not used in the classification, since they were less reliably observed. The paucity of distinctive artifacts from which to make inferences of activity was the primary factor in selecting this approach.

A descriptive, essentially monotypic classification system was used to order the sample. The base data was scaled at either nominal or ordinal levels: estimates of flake and ceramic densities were made at each site and treated exponentially to allow rank-ordering. Remaining elements were either counted (e.g. number of mortars) or simply noted as present. Functional (e.g. residential, extractive, production) or impressionistic (e.g. village, quarry, camp) definitions were avoided to maintain the relationship of formal elements to site types. This allowed greater control over the effect of particular elements or features in the distribution of site types to location, or association with specific environmental factors. Because site definitions are explicit, the sample could later be reclassified under more interpretive, polytypic criteria.

Table 7 presents the distribution of sites and features from all stages of the sample and the criteria used to define each site class. Some gross characteristics of the distribution are noteworthy. The largest class of sites are roasting pits (44%) which with other features such as cupules, pictographs, rockwalls and flake and sherd isolates account for 61% of the sample. These types seldom had any other artifact associations. Of the remaining sites, 12% are single component scatters or clusters, 12% have two components present, and 15% are aggregates. Two-thirds evidence some sort of vegetal food processing features. Fifteen percent are probably habitational sites, based on their size, complexity of aggregate features or preserved midden, and 1% appear to be non-economic or non-habitational. The frequency of ceramics and milling, and the emphasis of vegetal foods processing support the conclusion reached earlier: that is, there is a predominance of the late prehistoric tradition evidenced in the archaeological record.



TABLE 7  
SITE TYPE CLASSIFICATIONS (All Stages)

| <u>ASM</u> | <u>BLM</u> |                                                                  | <u>No. in Class</u> |       |
|------------|------------|------------------------------------------------------------------|---------------------|-------|
| 02         | 01,02      | Temporary Camp (Flaked Lithics/Ceramics/Milling)                 | 36                  | 14.2% |
| 03         | 02         | Large Sherd-Lithic Scatter ( $10^3\text{m}^2$ or greater)        | 6                   | 2.4%  |
| 04         | 02         | Small Sherd-Lithic Scatter (less than $10^3\text{m}^2$ )         | 10                  | 3.9%  |
| 05         | 05b        | Large Light Lithic Scatter ( $10^3\text{m}^2$ +; density)        | 2                   | 0.8%  |
| 06         | 05c        | Small Dense Lithic Scatter ( $<10^3\text{m}^2$ ; density)        | 2                   | 0.8%  |
| 07         | 05d        | Small Light Lithic Scatter ( $<10^3\text{m}^2$ ; density)        | 9                   | 3.5%  |
| 08         | 16         | Isolated Chipped Stone                                           | 16                  | 6.3%  |
| 09         | 02         | Groundstone (Milling) Sherds                                     | 4                   | 1.6%  |
| 10         | 04         | Groundstone (Milling) Only                                       | 11                  | 4.3%  |
| 11         | 16         | Rubs (Milling) Only                                              | 1                   | 0.4%  |
| 12         | 07         | Sherd Scatter ( $N > 10^1$ )                                     | 6                   | 2.4%  |
| 13         | 07         | Isolated Sherd ( $N < 10^1$ )                                    | 25                  | 9.8%  |
| 14         | 15         | Roasting Pit with No or One Artifact                             | 107                 | 42.1% |
| 15         | 02         | Roasting Pit with Rubs and/or Sherds                             | 5                   | 2.0%  |
| 16         | 03a        | Rockshelter with Sherds-Lithics-Milling (2 of 3)                 | 3                   | 1.2%  |
| 17         | 03b        | Rockshelter with Sherds or Lithics                               | 0                   | 0.0%  |
| 18         | 16         | Rockshelter with Ceremonial Functions (Pictograph, Spirit Stick) | 3                   | 1.2%  |
| 19         | 13         | Pictograph                                                       | 1                   | 0.4%  |
| 20         | 16         | Rockwall Feature                                                 | 1                   | 0.4%  |
| 21         | 02         | Groundstone (Milling)-Chipped Stone                              | 3                   | 1.2%  |
| 22         | 16         | Cupules                                                          | 2                   | 0.8%  |
| 23         | 16         | Rock Circle Feature                                              | 1                   | 0.4%  |



More detailed analysis of inter-class variability should be conditionalized by region, sample stage (the third stage was not randomly selected), and site recordation techniques, to control bias from sample design and recording errors. For these reasons, the density estimates are a more technically appropriate estimate of the overall distribution. A less formal discussion of regional inter-class distributions is presented later, utilizing both the systematic and previously recorded samples. Before presenting the analysis of site type distributions, the degree of intra-class variability is further qualified by examining artifact and feature distributions within types.

Intra-class variability was measured on a scale of complexity by counting the number of secondary elements (i.e. elements not affecting site classification) present within each class, including: midden, tools, buffware, features, milling, ground-stone types. This measure was unweighted: midden or tools or features were given equal value. It tested the adequacy of definitional criteria by evaluating homogeneity within each class, and the degree to which the definitional components encompassed the range of elements observed. Tables 8 and 9 present a breakdown of these elements and the number of additional elements by site types. There is a tendency for the complexity measure to increase as the number of components increases and as areal size and flake and ceramic densities increase. This is the expected trend of the distribution and supports the gross utility of the measure.

From Tables 8 and 9, only one type class (type 2 aggregates, or as they will be informally called, temporary camps) exhibits a significant degree of complexity not defined in the site typology. The occurrence of additional elements in other site types are less frequent, with most cases being an additional artifact form within the definitional component (e.g. a core at a flake scatter or basins and slicks at a milling feature). Type 2 sites, then, exhibit the greatest degree of heterogeneity. Their suitability for use as a class was tested by comparing secondary element distributions across the type class, controlling for variability within the primary components by ordering the set of ceramic and flaked lithic density classes and aggregates or milling features (Table 10).

The sample size within the type class (36) was too small to apply formal tests of homogeneity. As an approximation, the median point of secondary element distribution by ceramic/flake class intervals was tested to see if the size of the two groups of sites so formed was equal. The median fell roughly between ceramic/flake intervals IV-IV, dividing the sample into two groups of 23 and 12 sites, each of which account for approximately 50% of the secondary element occurrences. The mean average complexity of each new class was 2.0 vs. 6.0, which demonstrates a large difference in the degree elements co-occur



as the size and density of ceramic and flake refuse increases. Further, ten of the twelve sites above intervals IV-IV have both bedrock and portable milling recorded, while the distribution of milling within the other group is more variable.

|                     |       | <u>Bedrock/<br/>Portable</u> | <u>Bedrock<br/>Only</u> | <u>Portable<br/>Only</u> |    |
|---------------------|-------|------------------------------|-------------------------|--------------------------|----|
| flake/ceramic IV-IV | ABOVE | 10                           | 1                       | 1                        | 12 |
| flake/ceramic IV-IV | BELOW | 10                           | 7                       | 6                        | 23 |
| TOTAL               |       | 20                           | 8                       | 7                        | 35 |

It appears group IV-IV ABOVE Bedrock/Portable may describe an internally consistent set, distinct from other type 2 sites. The occurrence of elements in this new set was tabulated to isolate those most common:

| <u>MORTARS</u> | <u>SLICKS</u> | <u>MANO</u> | <u>METATE</u> | <u>FLAKED<br/>TOOLS</u> | <u>BROWN AND<br/>BUFF WARES</u> | <u>MIDDEN</u> |
|----------------|---------------|-------------|---------------|-------------------------|---------------------------------|---------------|
| 30%            | 100%          | 100%        | 70%           | 80%                     | 80%                             | 90%           |

This composition is consistent with the expected diversity of artifacts and features present at occupational sites. However, even in this most complex group most elements are simple extensions of primary components. Some smaller sites include similar features and levels of complexity, and recording procedures and site condition may have skewed the distribution. It is likely that larger sites originally had greater numbers of tools and other elements. They are therefore more likely to retain these features through time. There may be evidence to support reclassification of type 2 sites into at least two groups (milling areas and habitation areas) based on amount and density of flaked lithic and ceramic refuse, and the co-occurrence of milling features and groundstone artifacts. Specific conditions or rules for set formation cannot be formulated given the limited sample size and variability in site integrity.

The rationale for proposing twenty-three site types was based on variability observed in the sample as tested by the occurrence of elements not affecting classification. This may overemphasize the importance of the qualitative distribution of components which are not weighted. Basic descriptive results are reported using the classification. Site types containing similar elements or components, for example, all sites with milling attributes, were also tested for regional and environmental distribution. These tests evaluated the importance of particular elements or components as a means to suggest practical reclassifications based upon areal distribution and environmental patterning.



TABLE 8

Distributions of Formal Elements by Site Types

| <u>ELEMENTS</u>                                    | <u>SITE TYPES</u> |          |          |          |          |          |          |          |           |           |              | <u>Total</u> |
|----------------------------------------------------|-------------------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|--------------|--------------|
|                                                    | <u>2</u>          | <u>3</u> | <u>4</u> | <u>5</u> | <u>6</u> | <u>7</u> | <u>8</u> | <u>9</u> | <u>10</u> | <u>21</u> | <u>16,18</u> |              |
| Midden                                             | 18                | 1        | 1        | 1        |          |          |          |          | 1         | 1         | 1            | 24           |
| Shell                                              | 3                 |          |          |          |          |          |          |          |           |           |              | 3            |
| Bone                                               | 1                 |          |          |          |          |          |          |          |           |           |              | 1            |
| Flaked Lithic:<br>Production<br>(Core/Hammerstone) | 17                | 3        | 2        | 2        | 1        | 1        |          |          |           |           |              | 26           |
| Tools<br>(Scraper, Blade, Chopper, etc.)           | 20                | 1        | 2        | 1        | 1        | 2        |          |          |           | 1         |              | 28           |
| Waste*                                             | 33                | 7        | 10       | 2        | 1        | 8        |          |          |           | 3         | 3            | 67           |
| Obsidian                                           | 12                | 2        | 2        |          |          |          |          |          |           |           |              | 16           |
| Ceramics*                                          | 34                | 7        | 10       |          |          |          |          | 4        |           |           |              | 56           |
| Buffware                                           | 18                | 1        | 3        |          |          |          |          |          |           |           |              | 21           |
| Groundstone*                                       | 27                |          |          |          |          |          |          | 1        | 2         | 1         |              | 31           |
| Bedrock Milling*                                   | 28                |          |          |          |          |          |          | 4        | 8         | 2         | 1            | 43           |
| Mortars                                            | 18                |          |          |          |          |          |          | 1        | 2         | 2         | 1            | 24           |
| Cupules                                            | 8                 |          |          |          |          |          |          |          |           | 1         |              | 9            |
| Pictograph                                         | 1                 |          |          |          |          |          |          |          |           |           |              | 1            |
| House Depressions                                  | 1                 |          |          |          |          |          |          |          |           |           |              | 1            |
| Rock Features                                      | 2                 |          |          |          |          |          |          | 1        |           |           | 1            | 4            |
| Roasting Pits, etc.                                | 5                 | 1        | 1        |          | 1        |          |          |          |           | 1         | 1            | 10           |

( \*Used in Site Classification as Primary Element)



TABLE 9: Site Complexity

Number of Additional Elements by Site Types

| SITE TYPES                           | NUMBER OF ELEMENTS |          |          |          |          |          |          |          |          |   | Mean<br>Average | Row<br>Total |
|--------------------------------------|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|---|-----------------|--------------|
|                                      | Minimum            | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | <u>6</u> | <u>7</u> | <u>8</u> |   |                 |              |
| Temporary Camp                       | 2                  | 2        | 7        | 6        | 6        | 5        | 4        | 3        |          | 1 | 3.0             | 34           |
| Large Sherd-Lithic Scatter           | 3                  | 2        | 1        | 4        |          |          |          |          |          |   | 1.3             | 7            |
| Small Sherd-Lithic Scatter           | 4                  | 8        | 1        |          | 1        |          |          |          |          |   | 1               | 10           |
| Large Light Lithic Scatter           | 5                  | 0        | 1        |          | 1        |          |          |          |          |   | 2.0             | 2            |
| Small Dense Lithic Scatter           | 6                  | 0        | 1        | 1        |          |          |          |          |          |   | 1.5             | 2            |
| Small Light Lithic Scatter           | 7                  | 6        | 1        | 1        |          | 1        |          |          |          |   | 1               | 9            |
| Groundstone-Sherds                   | 9                  | 3        | 1        |          |          |          |          |          |          |   | 1               | 4            |
| Groundstone Only                     | 10                 | 6        | 4        | 1        |          |          |          |          |          |   | 1               | 11           |
| Roasting Pit with Rubs and/or Sherds | 15                 | 2        | 3        |          |          |          |          |          |          |   | 1               | 5            |
| Rockshelter with Rubs and/or Sherds  | 16                 | 2        |          | 1        |          |          |          |          |          |   | 1               | 3            |
| Rockshelter with Ceremonial Function | 18                 | 1        | 2        |          |          |          |          |          |          |   | 1               | 3            |
| Groundstone-Chipped Stone            | 21                 | 0        |          | 2        | 1        |          |          |          |          |   | 2.5             | 3            |
| COLUMN TOTALS                        |                    | 32       | 22       | 16       | 9        | 5        | 5        | 3        | 0        | 1 |                 | 88           |



# DISTRIBUTION OF FORMAL ELEMENTS

$$IV \quad N = 10^4$$

Key: 1-5 m  
SIZE: 10  
STRATUM: W-Desert Valley M-Mountain C-Canyon W-Mountain Valley  
REGION: C-Canebrake V-Vallejos MC-McCain TN-Table Mountain



The analyses of temporal and formal characteristics were conducted, with several major problems evident. Variability in artifact assemblages and site morphologies are more continuous than discrete, such that the differences in repeatedly used milling stations and smaller habitation sites are not easily discerned. It is likely that the smallest and largest type 2 aggregates represent different kinds of use or functions; and that certain cases classified under separate types (e.g. type 21, 16, 4) may be similar enough to be more properly grouped than separated. Limited sample sizes and the lack of diagnostic artifact forms confound the issue. The existing record poses additional problems: areal definition, ambiguous documentation, and idiomatic interpretation. The system used here was an attempt to develop classifications that are empirically demonstrable, and that can be incorporated under settlement or subsistence models in future research.

### Density Estimates

Density estimates for the entire McCain Valley Study Area and the seven sections are presented below. The notation and equations necessary for these calculations are introduced in Figure 10 and are used throughout this section (Cochran, 1977). The formulas are appropriate when a simple random sample is chosen within each stratum. In Stage I, the sample was selected using an interval method with a random seed. This selection process is not the same as choosing a simple random sample. However, if it is assumed that the ordering of quarter sections for sampling has no effect on the outcome of site distribution, Stage I transects may be considered randomly selected. In other words, if the quarter sections were numbered east to west, starting in the southeast corner rather than the northwest corner, the probability of locating sites would not change.

Stage II transects were randomly selected, with transects overlapping those from Stage I deleted from the sample. For estimation purposes, data from both Stage I and II are used. In combining the stages, the deletion of overlapping transects and its effect on independence were considered. However, Park (1978) has shown that the resultant combined sample mean is an unbiased estimator of the population mean and has a lower variance than if Stage I and II transects were independently chosen (overlapping transects included). The formulas are appropriate and are used to compute site estimates and to develop approximate confidence intervals.

### Point Estimates

Data used in computing estimates are summarized in Table 11. Table 12 contains site density estimates (per square mile) for each site type within the study area and three sections: Vallecito-Canebrake, McCain Valley, and Table Mountain. Four of the seven sections are missing: San Ysidro



Let L denote the number of strata. The symbols below refer to stratum h.

$N_h$  = number of potential transects

$n_h$  = number of transects in sample

$y_{hi}$  = number of sites in  $i^{th}$  transect in sample

$W_h = \frac{N_h}{N}$  = stratum weight

$f_h = \frac{n_h}{N_h}$  = sampling fraction

$\bar{y}_h = \frac{\sum_{i=1}^{n_h} y_{hi}}{n_h}$  = sampling mean

$s_h^2 = \frac{\sum_{i=1}^{n_h} (y_{hi} - \bar{y}_h)^2}{(n_h - 1)}$  = sampling variance

$N = \sum_{h=1}^L N_h$  = Total number of potential transects in study area.

The following equations are used to:

- (1) Estimate the average number of sites per transect,

$$\bar{Y}_{st} = \sum_{h=1}^L W_h \bar{y}_h: \text{ stratified sample mean}$$

- (2) Estimate the total number of sites, Y

$$Y_{st} = N \bar{Y}_{st}: \text{ estimate of population total Y}$$

- (3) Construct 90% confidence intervals around

$$\bar{Y}_{st} \pm t_{(.10, d.f.)} s(\bar{Y}_{st}): \text{ population mean C.I.}$$

- (4) Construct 90% confidence intervals for Y

$$N s(\bar{Y}_{st}) \pm t_{(.10, d.f.)} N s(\bar{Y}_{st}): \text{ population total C.I.}$$

where  $s^2(\bar{Y}_{st}) = \frac{1}{N^2} \sum_{h=1}^L N_h (N_h - n_h) \frac{s_h^2}{n_h}$  and  $t_{(.10, d.f.)}$  is the

t-value corresponding to  $\alpha = .10$  and d.f. is calculated degrees of freedom.

"Notation and Equations Used for Calculating Density Estimates"

FIGURE 10



Mountain, San Felipe Hills, Banner-Julian, and Oriflamme. This does not imply that no sites are in these regions; this merely indicates that no sites were found in the samples within these regions.

Population total estimates are in Table 13. Figures are given for each section and for strata within each section. Note that the overall estimates are not necessarily the sum of the section totals -- in the case of temporary camps the sum from each section is  $171 + 134 + 66 = 371$ , which is not equal to 402, the overall estimate. The discrepancy is due to the inclusion of areas which were not surveyed due to insufficient land area, such as the Desert Valley stratum in the McCain Valley section. Rather than concluding that no sites exist in these areas, an appropriate assumption is that site densities of unsurveyed lands are approximately equal to the average for that particular section. For example, from Table 12 the estimated density for temporary camps in the McCain Valley section is 2.26 sites per square mile, so the "best" estimate for the Desert Valley in that section is also 2.26 sites per square mile. This produces a slight bias; however, as site densities are usually underestimated, the overall estimates are reasonable. (For density estimates it is assumed that every site within a sample transect is found. However, from a practical viewpoint, this ideal cannot be attained in the field.)

#### Confidence Interval Estimates

There are two types of estimation: point and interval. Site estimates in Table 14 are point estimates of the population mean and population totals respectively. The question arises about the accuracy of these estimates. This is where an interval estimate comes into play; it is a measure of the degree of confidence in a point estimate.

An interval estimate consists of two possible values of the parameter being estimated -- a lower value and an upper value. A number  $(1-\alpha) \times 100\%$  is chosen to express the degree of confidence in a confidence interval. As an example, Let  $(1-\alpha) \times 100\% = 90\%$  and  $n = 100$  be a sample size. The probabilistic interpretation states that in repeated sampling, 90% of the intervals constructed of size 100 from the same population contain the true mean,  $\mu$ . From a practical standpoint, only one confidence interval is actually calculated; that is, only one sample of size  $n = 100$  is used. The claim, then, is that one is 90% confident that the single interval constructed contains the true mean,  $\mu$ .

Table 14 contains point and approximate 90% confidence interval estimates for the mean and population totals for all sites, within various strata and sections. For example, in Table Mountain, a point estimate for the population total 430; the corresponding 90% confidence interval for the total is 338, 522. What is effectively being stated is that one is



90% confident that the true population total lies between 338 and 522.

A confidence interval is very useful in illustrating the strengths and weaknesses of a point estimate. For example, in Table Mountain the site total is estimated to lie between 338 and 522, which is fairly precise considering the small sample size taken. Conversely, consider the McCain Valley-Mountain stratum in Table 14. The point estimate is 622; the 90% confidence level is 19 to 1224. The interval estimate states that the true number of sites can lie anywhere between 19 and 1224, with 90% confidence. Thus the point estimate of 622, although unbiased, is very imprecise.

The reason for such a large confidence interval is the nature of the site distribution. Table 15 shows the number of sites per transect for Stages I and II. Several transects have an unusually large number of sites per transect. This creates a large variance, which in turn enlarges the confidence interval. As the confidence limits are inversely proportional to the square root of the sample size (see Figure 10), the only solution to improve the confidence interval is to enlarge the sample size.

Point estimates and confidence intervals for temporary camps are given in Table 16. All other site types either had too few sites for constructing intervals, or in the particular case of roasting pits, the variability is so extreme that the confidence intervals are highly questionable.

## Discussion

### Comparative Results

From Table 12 it appears that the density of site types across the various strata are not equal; that is, for a given site type, the estimated densities vary according to strata and section. A one way Analysis of Variance, however, shows that in a comparison of the densities for each site type in each strata and/or section there does not exist a significantly higher density in any stratum for any site type except roasting pits, which has a statistically higher density in Vallecito-Canebrake than either McCain Valley or Table Mountain. However, excluding roasting pits, Table Mountain has a significantly higher density of total sites than any other section (at  $\alpha = 0.10$ ).

It is surprising that so few significant differences between strata appear. There are two basic reasons why this may occur: (1) there simply are no differences between strata densities, or (2) the sample sites involved are not large enough to enable the test to discern any significant differences. Assuming that the small sample sizes are critical



here, and that differences in densities do in fact exist, what may be done is to examine the consistency of expected densities across the strata. For instance, as anticipated, the valley strata have higher temporary camp densities than the respective mountain strata in McCain Valley and Vallecito-Canebrake, and Table Mountain, although anomalous with other mountain strata, has a high density which is consistent with studies in that area. Although not statistically different, the comparative densities are as anticipated. A larger sample would undoubtedly find differences between temporary camp densities as large as 6.86 in Table Mountain to 1.14 in McCain Valley-Mountain strata significant.

### Additional Considerations

Intrinsic to the formulas involving confidence intervals is the assumption that the average number of sites per transect is approximately normally distributed. For "large" sample sizes this is a reasonable assumption. A "large" number of transects is entirely dependent upon the nature of the site distribution being studied (see Cochran, 1977). As the number of transects in the McCain Valley Study Area is rather small, the question of normality becomes valid. As noted, "approximate" 90% confidence intervals were calculated. Comparisons between strata in a given table are therefore indicative of the magnitude of the differences in densities at approximately 90% confidence. For "exact" confidence intervals, the sample sizes in the given strata would have to be nearly tripled (based on formulas in Cochran 1977).

An alternative method of comparing strata densities is to compare the proportions of transects that have sites between each strata (Mueller 1975:138). The problem of normality is circumvented but the loss of information is severe. For instance, if a transect has 3 temporary camps and 2 lithic scatters, by looking only at the presence or absence of sites in a given transect, this transect is given a weight of only 1 site (presence). However, for completeness and for comparison, the method is developed.

Table 17 is a breakdown of six sections and the corresponding proportion of sites per transect. The test statistic is:

$$\chi^2 = \frac{1}{\bar{p} \bar{q}} \sum_{i=1}^n n_i (p_i - \bar{p})^2$$

In this case  $n = 6$ , and the calculated  $\chi^2$  is compared with  $\chi^2$  with 5 degrees of freedom = 9.24 (at  $\alpha = 0.10$ ).

From Table 17, the calculated  $\chi^2 = 6.56$ , which is not



significant. Therefore, the conclusion that overall site density is similar throughout the study area is in slight disagreement with the ANOVA procedures, where it was concluded Table Mountain has highest density.

Tables 18 and 19 similarly test the presence or absence of temporary camps and roasting pits, respectively, with respect to strata. For temporary camps the  $X^2 = 4.298$ , which is not significant. For roasting pits, the  $X^2$  value of 19.8353 is highly significant. From Table 19 it appears the Vallecito-Canebrake Mountain stratum is significantly larger than the others. Partitioning the table into two groups, the first consisting of the Vallecito-Canebrake-Mountain stratum, the second containing the remaining strata, the significance of the difference between groups 1 and 2 as well as a test of homogeneity of the remaining strata in group 2 may be tested (Fleiss, 1973:92-96).

The chi-square due to differences between the first and second group is  $X^2_{diff} = 12.8085$  and  $X^2_{group\ 2} = 7.0268$ . As the partitioning of the two groups occurred after looking at the data, each  $X^2$  value should be tested against  $X^2_{.95,5} = 11.07$  (Miller, 1966). The Vallecito-Canebrake Mountain stratum has a more significant proportion of roasting pits than the rest of the strata, but there were no significant differences among the proportions in McCain Valley, Table Mountain, and Vallecito-Canebrake Desert Valley strata.

At this point it is appropriate to emphasize the importance of sample size, and its relation to the power of a test. The power of a test is the ability of that test to identify a significant relationship when one actually exists. Again, Table 18 shows the proportion of transects with temporary camps for each of the six sections. Comparing the proportion of McCain Valley-Mountain stratum to Table Mountain (0.5714), there is apparently a large difference in proportions. But according to the sample taken, this difference was found insignificant. The problem is that the sample sizes were not large enough to detect even a difference as large as 0.5714 to 0.1429. Tables from Fleiss (1973) show that to find a difference of .60 to .15 insignificant at  $\alpha = 0.05$  with power of 80%, 25 transects from McCain Valley-Mountain stratum and 25 from Table Mountain should have been taken. Thus the sample sizes used do not allow any but extremely gross differences in densities to be located.

There does not appear to be a statistically higher density of any specific site type, except roasting pits, between any of the six sections. These data are consistent with that of prior studies in the area: roasting pits are located in the mountain strata with temporary camps in the valley systems (Table Mountain being an anomaly). The average density over all site types (excluding roasting pits) is



TABLE 11  
Data Used in Computing Density Estimates

| REGION              | $N_h$ | $n_h$ | $w_{hj}$ | $f_{hj}$ | All Sites |        | All Sites** |       | Temporary Camps |       |
|---------------------|-------|-------|----------|----------|-----------|--------|-------------|-------|-----------------|-------|
|                     |       |       |          |          | $\bar{y}$ | $s^2$  | $\bar{y}$   | $s^2$ | $\bar{y}$       | $s^2$ |
| San Ysidro          |       |       |          |          |           |        |             |       |                 |       |
| Mountain            | 24    | 1     | .923     | .041     |           |        |             |       |                 |       |
| *Regional Total     | 24    | 1     | .023     | .041     |           |        |             |       |                 |       |
| San Felipe          |       |       |          |          |           |        |             |       |                 |       |
| Mountain            | 44    | 2     | .916     | .045     | .500      | .500   |             |       |                 |       |
| *Regional Total     | 44    | 2     | .043     | .045     | .500      | .337   |             |       |                 |       |
| Banner-Julian       |       |       |          |          |           |        |             |       |                 |       |
| Mountain            | 41    | 2     | .931     | .048     |           |        |             |       |                 |       |
| *Regional Total     | 41    | 2     | .040     | .048     |           |        |             |       |                 |       |
| Oriflamme Mountain  |       |       |          |          |           |        |             |       |                 |       |
| Mountain            | 37    | 1     | .840     | .027     |           |        |             |       |                 |       |
| *Regional Total     | 37    | 1     | .036     | .027     |           |        |             |       |                 |       |
| Vallecito-Canebrake |       |       |          |          |           |        |             |       |                 |       |
| Mountain            | 265   | 8     | .652     | .030     | 6.500     | 80.857 | 1.625       | 3.982 | .250            | .214  |
| Desert Valley       | 140   | 16    | .344     | .114     | 2.562     | 8.662  | 1.562       | 2.795 | .625            | .783  |
| *Regional Total     | 405   | 24    | .402     | .059     | 5.126     | 4.232  | 1.599       | .262  | .378            | .016  |
| McCain Valley       |       |       |          |          |           |        |             |       |                 |       |
| Mountain            | 181   | 7     | .461     | .038     | 2.857     | 14.809 | .571        | 1.285 | .142            | .142  |
| Mountain Valley     | 187   | 21    | .477     | .112     | 2.047     | 3.747  | 2.047       | 3.747 | .428            | .657  |
| Canyon              | 20    | 4     | .051     | .200     | 2.750     | 12.250 | .750        | .250  | .250            | .250  |
| *Regional Total     | 388   | 32    | .385     | .082     | 2.436     | .476   | 1.278       | .073  | .283            | .010  |
| Table Mountain      |       |       |          |          |           |        |             |       |                 |       |
| Mountain            | 68    | 7     | .918     | .102     | 5.142     | 2.476  | 3.428       | 3.619 | .857            | .809  |
| *Regional Total     | 68    | 7     | .067     | .102     | 5.142     | .317   | 3.428       | .463  | .857            | .103  |



TABLE 12  
Site Type Density Estimates Per Square Mile

|                                        | VALLEJO-CANEBAKE |               |       | MCCAIN   |                 |        | TABLE |      |       |       |
|----------------------------------------|------------------|---------------|-------|----------|-----------------|--------|-------|------|-------|-------|
|                                        | Mountain         | Desert Valley | Total | Mountain | Mountain Valley | Canyon |       |      |       |       |
| Temporary Camp                         | 2                | 2.00          | 5.00  | 3.03     | 1.14            | 3.43   | 2.00  | 2.26 | 6.86  | 2.55  |
| Large Sherd-Lithic Scatter             | 3                |               |       |          |                 | .76    | 2.00  | .46  | 3.43  | .41   |
| Small Sherd-Lithic Scatter             | 4                |               | 1.00  | .34      |                 | .76    |       | .36  | 3.43  | .51   |
| Large Light Lithic Scatter             | 5                |               |       |          |                 |        |       |      | 3.43  | .23   |
| Small Dense Lithic Scatter             | 6                |               |       |          |                 | .38    |       | .18  | 1.14  | .15   |
| Small Light Lithic Scatter             | 7                |               |       |          | 1.14            | 1.90   |       | 1.43 | 2.29  | .71   |
| Isolated Chipped Stone                 | 8                |               |       |          |                 | 4.57   |       | 2.18 | 3.43  | 1.07  |
| Groundstone-Sherds                     | 9                | 2.00          |       | 1.31     |                 |        |       |      |       | .52   |
| Groundstone Only                       | 10               | 1.00          | 1.50  | 1.17     | 1.14            |        |       | .53  | 2.29  | .83   |
| Rubs Only                              | 11               | 1.00          |       | .65      |                 |        |       |      |       | .26   |
| Isolated Sherd or Small Sherd Scatter  | 13               | 4.00          | 3.50  | 3.82     | 1.14            | 3.05   |       | 1.98 |       | 2.30  |
| Roasting Pit with Ho or One Artifact   | 14               | 37.00         | 7.50  | 26.73    | 18.28           |        | 14.00 | 9.16 | 13.71 | 15.26 |
| Roasting Pit with Rubs and/or Sherds   | 15               | 2.00          | .50   | 1.48     |                 |        | 2.00  | .10  |       | .63   |
| Rockshelter with Sherds-Lithic-Milling | 16               |               |       |          |                 | .76    | 2.00  | .46  |       | .18   |
| Rockshelter with Ceremonial Functions  | 18               | 2.00          | .50   | 1.48     |                 |        |       |      |       | .60   |
| Pictograph                             | 19               |               |       |          |                 |        |       |      | 1.14  | .08   |
| Rockwall                               | 20               | 1.00          |       | .65      |                 |        |       |      |       | .26   |
| Groundstone-Chipped Stone              | 21               |               | 1.00  | .34      |                 |        |       |      |       | .14   |
| Cupules                                | 22               |               |       |          |                 | .76    |       | .36  |       | .14   |



TABLE 13

## Site Type Population Total Estimates

|                                                 | VALLECITO-CANEDRAKE |                  |       |          |                    | MCCAIN |       |          | Overall<br>Total |
|-------------------------------------------------|---------------------|------------------|-------|----------|--------------------|--------|-------|----------|------------------|
|                                                 | Mountain            | Desert<br>Valley | Total | Mountain | Mountain<br>Valley | Canyon | Total | Mountain |                  |
| Temporary Camp                                  | 2 74                | 98               | 171   | 31       | 97                 | 6      | 134   | 66       | 402              |
| Large Sherd-Lithic Scatter                      | 3                   |                  |       |          | 21                 | 6      | 27    | 33       | 65               |
| Small Sherd-Lithic Scatter                      | 4                   | 20               | 20    |          | 21                 |        | 21    | 33       | 80               |
| Large Light Lithic Scatter                      | 5                   |                  |       |          | 11                 |        | 11    | 11       | 24               |
| Small Dense Lithic Scatter                      | 6                   |                  |       | 31       | 54                 |        | 84    | 22       | 112              |
| Small Light Lithic Scatter                      | 7                   |                  |       |          | 129                |        | 129   | 33       | 169              |
| Isolated Chipped Stone                          | 8                   |                  |       |          |                    |        |       |          | 82               |
| Groundstone-Sherds                              | 9 74                |                  | 74    |          |                    |        |       |          |                  |
| Groundstone Only                                | 10 37               | 29               | 66    | 31       |                    |        | 31    | 22       | 131              |
| Rubs Only                                       | 11 37               |                  | 37    |          |                    |        |       |          | 41               |
| Isolated Sherd or Small Sherd Scatter           | 13 148              | 69               | 217   | 31       | 86                 |        | 117   |          | 362              |
| Roasting Pit with No or One Artifact            | 14 1365             | 147              | 1512  | 497      |                    | 42     | 539   | 131      | 2396             |
| Roasting Pit with Rubs and/or Sherds            | 15 74               | 10               | 84    |          |                    | 6      | 6     |          | 99               |
| Rockshelter with Sherds-Lithic-Milling          | 16                  |                  |       |          | 21                 | 6      | 27    |          | 28               |
| Rockshelter with Ceremonial Function Pictograph | 18 74               | 10               | 84    |          |                    |        |       | 11       | 95               |
| Rockwall                                        | 20 37               |                  | 37    |          |                    |        |       |          | 13               |
| Groundstone-Chipped Stone                       | 21                  | 20               | 20    |          |                    |        |       |          | 41               |
| Cupules                                         | 22                  |                  |       |          | 21                 |        | 21    |          | 22               |
| TOTAL                                           | 1920                | 403              | 2322  | 621      | 461                | 66     | 1147  | 395      |                  |



TABLE 14

Point and Approximate 90% Confidence Interval Estimates  
for the Mean and Population Totals

| All Sites                       | Density of Sites<br>(per sq. mile) | 90% Confidence<br>Intervals on $\bar{y}$ | Population<br>Total Estimates | 90% Confidence<br>Interval on<br>Population Totals |
|---------------------------------|------------------------------------|------------------------------------------|-------------------------------|----------------------------------------------------|
| San Ysidro                      | -                                  | -                                        | -                             | -                                                  |
| San Felipe                      | 4.00                               | -                                        | 36                            | -                                                  |
| Banner-Julian                   | -                                  | -                                        | -                             | -                                                  |
| Oriflamme Mountain              | -                                  | -                                        | -                             | -                                                  |
| Vallecito-Canebrake<br>Mountain | 52.00                              | (4.54, 99.46)                            | 1919                          | (168, 3670)                                        |
| Desert Valley                   | 20.50                              | (10.79, 30.21)                           | 401                           | (211, 592)                                         |
| Total Region                    | 41.01                              | (9.82, 72.19)                            | 2321                          | (555, 4086)                                        |
| McCain<br>Mountain              | 22.86                              | (0.69, 45.02)                            | 622                           | (19, 1224)                                         |
| Mountain Valley                 | 16.38                              | (10.89, 21.87)                           | 462                           | (307, 617)                                         |
| Canyon                          | 22.00                              | -                                        | 66                            | -                                                  |
| Total Region                    | 19.49                              | (9.03, 29.94)                            | 1150                          | (532, 1767)                                        |
| Table Mountain                  | 41.14                              | (32.38, 49.89)                           | 430                           | (338, 522)                                         |
| Entire Study Area               | 27.07                              | (14.16, 39.99)                           | 4268                          | (2232, 6304)                                       |



TABLE 15  
Number of Sites Per Transect

| <u>Number of<br/>Sites/Transect</u> | <u>Number of<br/>Transects</u> | <u>Relative<br/>Frequency (%)</u> | <u>Cumulative<br/>Frequency (%)</u> |
|-------------------------------------|--------------------------------|-----------------------------------|-------------------------------------|
| 0                                   | 21                             | 30.4                              | 30.4                                |
| 1                                   | 12                             | 17.4                              | 47.8                                |
| 2                                   | 4                              | 5.8                               | 53.6                                |
| 3                                   | 6                              | 8.7                               | 62.3                                |
| 4                                   | 10                             | 14.5                              | 76.8                                |
| 5                                   | 6                              | 8.7                               | 85.5                                |
| 6                                   | 3                              | 4.3                               | 89.9                                |
| 7                                   | 3                              | 4.3                               | 94.2                                |
| 8                                   | 1                              | 1.4                               | 95.7                                |
| 10                                  | 1                              | 1.4                               | 97.1                                |
| 11                                  | 1                              | 1.4                               | 98.6                                |
| 28                                  | 1                              | 1.4                               | 100.0                               |
|                                     | <hr/> 69                       | <hr/> 100.0                       |                                     |



TABLE 16

Point and Approximate 90% Confidence Interval Estimates  
for Temporary Camps

| Temporary Camps<br>(ASM02)      | Density of Sites<br>(per sq. mile) | 90% Confidence<br>Intervals on $\bar{y}$ | Population<br>Total Estimates | 90% Confidence<br>Interval on<br>Population Totals |
|---------------------------------|------------------------------------|------------------------------------------|-------------------------------|----------------------------------------------------|
| San Ysidro                      | -                                  | -                                        | -                             | -                                                  |
| San Felipe                      | -                                  | -                                        | -                             | -                                                  |
| Banner-Julian                   | -                                  | -                                        | -                             | -                                                  |
| Oriflamme Mountain              | -                                  | -                                        | -                             | -                                                  |
| Vallecito-Canebrake<br>Mountain | 2.00                               | -                                        | 74                            | -                                                  |
| Desert Valley                   | 5.00                               | (2.08, 7.92)                             | 98                            | (41, 155)                                          |
| Total Region                    | 3.03                               | (1.23, 4.82)                             | 172                           | (69, 273)                                          |
| McCain                          |                                    |                                          |                               |                                                    |
| Mountain                        | 1.14                               | -                                        | 31                            | -                                                  |
| Mountain Valley                 | 3.43                               | (1.13, 5.73)                             | 96                            | (31, 162)                                          |
| Canyon                          | 2.00                               | -                                        | 56                            | -                                                  |
| Total Region                    | 2.27                               | (0.85, 3.68)                             | 134                           | (50, 217)                                          |
| Table Mountain                  | 6.86                               | (1.85, 11.86)                            | 72                            | (19, 124)                                          |
| Entire Study Area               | 2.54                               | (1.61, 3.47)                             | 400                           | (253, 547)                                         |



TABLE 17

Proportion of Transects with Sites

|                     | <u>Total Transects<br/>in Sample</u> | <u>No. of Transects<br/>with Sites</u> | <u>Proportion of Transects<br/>with Sites</u> |
|---------------------|--------------------------------------|----------------------------------------|-----------------------------------------------|
| Vallecito-Canebrake |                                      |                                        |                                               |
| Mountain            | 8                                    | 7                                      | 0.8750                                        |
| Desert Valley       | 16                                   | 11                                     | 0.6875                                        |
| McCain              |                                      |                                        |                                               |
| Mountain            | 7                                    | 4                                      | 0.5714                                        |
| Mountain Valley     | 21                                   | 13                                     | 0.6190                                        |
| Canyon              | 4                                    | 4                                      | 1.0000                                        |
| Table Mountain      |                                      |                                        |                                               |
| Mountain            | 7                                    | 7                                      | 1.0000                                        |
|                     | <hr/> 63                             | <hr/> 46                               | <hr/> 0.7302 = $\bar{p}$                      |

$$\chi^2 = 6.56$$

$$\text{Significance} = 0.2554$$



TABLE 18

## Proportion of Transects with Temporary Camps

|                     | <u>Total Transects<br/>in Sample</u> | <u>No. of Transects<br/>with<br/>Temporary Camps</u> | <u>Proportion of Transects<br/>with<br/>Temporary Camps</u> |
|---------------------|--------------------------------------|------------------------------------------------------|-------------------------------------------------------------|
| Vallecito-Canebrake |                                      |                                                      |                                                             |
| Mountain            | 8                                    | 2                                                    | 0.2500                                                      |
| Desert Valley       | 16                                   | 7                                                    | 0.4375                                                      |
| McCain              |                                      |                                                      |                                                             |
| Mountain            | 7                                    | 1                                                    | 0.1429                                                      |
| Mountain Valley     | 21                                   | 6                                                    | 0.2857                                                      |
| Canyon              | 4                                    | 1                                                    | 0.2500                                                      |
| Table Mountain      |                                      |                                                      |                                                             |
| Mountain            | 7                                    | 4                                                    | 0.5714                                                      |
|                     | <hr/> 63                             | <hr/> 21                                             | <hr/> 0.3333 = $\bar{p}$                                    |

$$\chi^2 = 4.2988$$

Significance = 0.5072



TABLE 19

## Proportion of Transects with Roasting Pits

|                     | <u>Total Transects<br/>in Sample</u> | <u>No. of Transects<br/>with Roasting Pits</u> | <u>Proportion of Transects<br/>with Roasting Pits</u> |
|---------------------|--------------------------------------|------------------------------------------------|-------------------------------------------------------|
| Vallecito-Canebrake |                                      |                                                |                                                       |
| Mountain            | 8                                    | 6                                              | 0.7500                                                |
| Desert Valley       | 16                                   | .3                                             | 0.1875                                                |
| McCain              |                                      |                                                |                                                       |
| Mountain            | 7                                    | 2                                              | 0.2857                                                |
| Mountain Valley     | 21                                   | 0                                              | 0.0000                                                |
| Canyon              | 4                                    | 1                                              | 0.2500                                                |
| Table Mountain      |                                      |                                                |                                                       |
| Mountain            | 7                                    | 3                                              | 0.4286                                                |
|                     | <u>63</u>                            | <u>15</u>                                      | <u>0.2381 = <math>\bar{p}</math></u>                  |

$$\chi^2 = 19.8353$$

Significance = 0.0013



highest in Table Mountain, being significantly larger than McCain Valley-Mountain stratum and Vallecito-Canebrake Desert Valley stratum at  $\alpha = 0.10$ . There is general agreement between the parametric ANOVA and non-parametric binomial (presence or absence) tests, although the power of both are impaired by small sample size.

## Environmental Variability

### Geology

Geologic structures and features in the project area were tested for their association with site distributions, since the major technologic adaptation through time was the use of lithic materials for milling or flaking tools. Flaked lithic source materials were available from volcanic and meta-volcanic formations within the Jacumba mountains, notably Table Mountain, and from more remote desert sources. Milling source materials occur throughout the area as granitic outcrops. Some selectivity was undoubtedly practiced for milling surfaces, but criteria such as crystallinity, hardness, morphology of outcrop, and distance to water or plant sources are very specific factors that are not possible to scale at this level of analysis.

Geological data recorded for the transect and site data files consisted of nine categories scaled from U.S.G.S. base maps. Examination of cross-classification tables revealed that with the small sample sizes, categories had to be collapsed to provide meaningful statistics. Granitic categories were combined, recent (Quaternary) alluvium and sedimentary deposits grouped, and miocene volcanic rock remained as the third category. These categories have specific regional distributions: metavolcanics are found in the Table Mountain section, Quaternary alluvium is in the Vallecito-Canebrake desert valleys, and the remaining area encompasses one of nine granitic categories, principally Mesozoic granitics or Pre-Cenozoic granitics and metamorphic rocks.

Table 20 contains the results of testing for the presence or absence of sites by geology by section. Site presence appears to be independent of geology. However, testing of site distribution by geology is severely hampered by the uniformity of rock formations within each section. Consider the McCain Valley-Mountain Valley stratum. There is only one geological rock classification, granitic, and therefore independence of sites and geology cannot be tested. The initial nine categories were re-examined for any possible associations between them and sites. The results were conclusive: no single grouping could be isolated to explain any variation in the presence or absence of any site type.

Stage I data are presented in Table 21; the results indicate that geology and site presence are independent. These



results should be interpreted as a function of the level of detail of the mapping used.

Previous research in the area (May, 1976; Rogers, 1966; Begole, 1976) and existing site records show a strong association between occupational phase, site density, and metavolcanic formations at Table Mountain, Volcanic Hills (Jacumba Mountains), and Carrizo Wash. Table Mountain has the highest density of sites in the study area, and is the only area where early occupation is documented. San Dieguito sites are reported here, in Carrizo Wash, and in other areas of the Jacumba Mountains. These sites are in association with metavolcanic formations. Throughout the area flaked lithic industries have high proportions of felsites, basalts, and other fine-grained rock from these source formations. By contrast, later occupations used local source materials, such as quartz, to a greater extent, which could demonstrate technological adaptation to the area over time. Aphanitic volcanics and metavolcanic porphyries from the Jacumba region predominate in the south, and decrease in frequency to the north, away from Table Mountain. Obsidian, jaspers, and other exotic materials increase in northern areas, such as Vallecito, which is closer to desert source areas than to Table Mountain.

Certain formations are particularly important as May's research for Table Mountain and existing records demonstrate. Availability of fine-grained volcanics may be the single most important factor explaining the distribution of San Dieguito sites in the immediate region. Later occupations, through technological and economic adaptations, are less dependent on these particular resources; these site distributions do not exhibit strong associations.

### Slope

Averaged percent slope was encoded for both site and transect data. Slope was tested because it had been used as a stratification variable for this region by Wells (1977) in Davies Valley and Weaver (1976) in Carrizo Gorge, following Weide's (1973) proposed stratification design. For both transect and site data the average slope of the surrounding terrain was scaled from U.S.G.S. 7.5 minute quadrangles, rather than from point sources in the field, to test whether map slope intervals are an effective stratification variable for discriminating site densities and type distributions. As a result of her study in Davies Valley, Wells concluded, "Upland areas of less than 10% slope exhibit the highest density of archaeological resources" (1977:20).

The densities of sites by percent slope were evaluated with Stage I data. Certain Stage I transects were not surveyed, so sample results are not strictly proportional;



but as only transects in severe terrain were eliminated, the bias introduced is toward overrepresentation of lower average slope intervals. The average slope for the transect as a whole was scaled as an approximation of the landform aspect.

Summary results of cross-classifying for the presence or absence of sites by slope using Stage I data are in Tables 23 and 24. Surprisingly, the results show that site presence and slope are independent; that more severe relief had the same proportions of transects as sites with milder aspects. The relationship of type 2 camps (the most complex sites) to slope is particularly interesting. Table 24 shows that 30% of the transects with camps exhibit average slope values exceeding 50%, which is contrary to common sense expectations and results of previous studies.

It is emphasized that the slope of the site is not being measured, but rather the surrounding terrain. This is somewhat misleading with transect data, as several intervals may have been averaged to produce the values. It is probably appropriate as a test of using a generalized slope interval stratification, however average slope does not appear to be effective as a principal discriminant for site density within this complex landform area. As a regional test, presence of type 2 sites by slope for section and landform strata is presented in Table 25. Note that the result is observed for all areas sampled, i.e. site presence and slope are independent in each area.

Site data, which is more specific since it was measured for the immediate area surrounding the site rather than the entire transect, correspond to transect results. Table 22 summarizes Stage I and II sample results. The most frequently occurring slope interval for all sites is from 11 to 35%, including all sites with milling and aggregate type 2 sites. While roasting pits are the most numerous features noted in severe terrain, more complex sites also occur frequently on steep slopes.

Slope interval stratifications of 0 to 10% do not isolate higher densities of sites, even of complex sites. Wells' conclusions concerning slope are apparently not as effective in this area as a general stratification procedure as also demonstrated by the formal landform stratification density estimates. The results do not suggest that complex sites are scattered across steep sideslopes, but that they may be situated at strategic locations within areas of steep terrain. This reflects that the scaling technique used an average value surrounding the site or over the area of a transect, rather than the slope of the site itself. More detailed landform analysis was conducted to further evaluate these results and may help clarify the conclusions.



TABLE 20  
Site Type by Geology

|                                            |    | <u>Granitic</u> | <u>MVA</u> | <u>QC-QAL</u> | <u>Row<br/>Total</u> |
|--------------------------------------------|----|-----------------|------------|---------------|----------------------|
| Temporary Camp                             | 2  | 18              | 0          | 11            | 29<br>14.3%          |
| Large Sherd-Lithic<br>Scatter              | 3  | 4               | 2          | 0             | 6<br>3.0%            |
| Small Sherd-Lithic<br>Scatter              | 4  | 3               | 0          | 4             | 7<br>3.4%            |
| Large Light Lithic<br>Scatter              | 5  | 0               | 1          | 1             | 2<br>1.0%            |
| Small Dense Lithic<br>Scatter              | 6  | 2               | 0          | 0             | 2<br>1.0%            |
| Small Light Lithic<br>Scatter              | 7  | 8               | 0          | 0             | 8<br>3.9%            |
| Isolated Chipped<br>Stone                  | 8  | 15              | 0          | 0             | 15<br>7.4%           |
| Groundstone-Sherds                         | 9  | 1               | 0          | 1             | 2<br>1.0%            |
| Groundstone Only                           | 10 | 6               | 0          | 1             | 7<br>3.4%            |
| Rubs Only                                  | 11 | 1               | 0          | 0             | 1<br>0.5%            |
| Isolated Sherd or<br>Small Sherd Scatter   | 13 | 15              | 0          | 5             | 20<br>9.9%           |
| Roasting Pit with<br>No or One Artifact    | 14 | 87              | 0          | 1             | 88<br>43.3%          |
| Roasting Pit with<br>Rubs and/or Sherds    | 15 | 4               | 0          | 0             | 4<br>2.0%            |
| Rockshelter with<br>Sherds-Lithics-Milling | 16 | 3               | 0          | 0             | 3<br>1.5%            |
| Rockshelter with<br>Ceremonial Functions   | 18 | 3               | 0          | 0             | 3<br>1.5%            |
| Pictograph                                 | 19 | 0               | 0          | 1             | 1<br>0.5%            |
| Rockwall                                   | 20 | 1               | 0          | 0             | 1<br>0.5%            |
| Groundstone-Chipped<br>Stone               | 21 | 1               | 0          | 1             | 2<br>1.0%            |
| Cupules                                    | 22 | 2               | 0          | 0             | 2<br>1.0%            |
| Column Total                               |    | 174<br>85.7%    | 3<br>1.5%  | 26<br>12.8%   | 203<br>100.0%        |



TABLE 21

## Presence/Absence of Sites by Geology

|                 | <u>Granitic</u> | <u>QC-QAL</u> | <u>Row Total</u> | (A) VALLECITO-<br>CANEBRAKE<br>Mountain |
|-----------------|-----------------|---------------|------------------|-----------------------------------------|
| Absence         | 1               | 0             | 1                |                                         |
| Presence        | 6               | 1             | 7                |                                         |
| Column<br>Total | 7               | 1             | 8                | Fisher's Exact<br>Test = 0.87500        |

|                 | <u>Granitic</u> | <u>QC-QAL</u> | <u>Row Total</u> | (B) VALLECITO-<br>CANEBRAKE<br>Desert Valley |
|-----------------|-----------------|---------------|------------------|----------------------------------------------|
| Absence         | 0               | 5             | 5                |                                              |
| Presence        | 3               | 8             | 11               |                                              |
| Column<br>Total | 3               | 13            | 16               | Fisher's Exact<br>Test = 0.29464             |

|                 | <u>Granitic</u> | <u>Total</u> | (C) McCAIN Mountain |
|-----------------|-----------------|--------------|---------------------|
| Absence         | 3               | 3            |                     |
| Presence        | 4               | 4            |                     |
| Column<br>Total | 7               | 7            |                     |

|                 | <u>Granitic</u> | <u>Row Total</u> | (D) McCAIN Mountain<br>Valley |
|-----------------|-----------------|------------------|-------------------------------|
| Absence         | 7               | 7                |                               |
| Presence        | 14              | 14               |                               |
| Column<br>Total | 21              | 21               |                               |

|                 | <u>Granitic</u> | <u>Row Total</u> | (E) McCAIN Canyon |
|-----------------|-----------------|------------------|-------------------|
| Absence         | 0               | 0                |                   |
| Presence        | 4               | 4                |                   |
| Column<br>Total | 4               | 4                |                   |

|                 | <u>Granitic</u> | <u>MVA</u> | <u>QC-QAL</u> | <u>Row Total</u> | (F) TABLE MOUNTAIN<br>Mountain |
|-----------------|-----------------|------------|---------------|------------------|--------------------------------|
| Absence         | 0               | 0          | 0             | 0                |                                |
| Presence        | 4               | 1          | 2             | 7                |                                |
| Column<br>Total | 4               | 1          | 2             | 7                |                                |



TABLE 22  
Site Type by Average Slope

|                                         |    | <u>0-10%</u> | <u>11-35%</u> | <u>35-55%</u> | <u>Greater<br/>than 55%</u> | <u>Total</u>  |
|-----------------------------------------|----|--------------|---------------|---------------|-----------------------------|---------------|
| Temporary Camp                          | 2  | 12           | 12            | 4             | 1                           | 29<br>14.3%   |
| Large Sherd-Lithic Scatter              | 3  | 3            | 3             | 0             | 0                           | 6<br>3.0%     |
| Small Sherd-Lithic Scatter              | 4  | 3            | 3             | 1             | 0                           | 7<br>3.4%     |
| Large Light Lithic Scatter              | 5  | 0            | 2             | 0             | 0                           | 2<br>1.0%     |
| Small Dense Lithic Scatter              | 6  | 2            | 0             | 0             | 0                           | 2<br>1.0%     |
| Small Light Lithic Scatter              | 7  | 4            | 4             | 0             | 0                           | 8<br>3.9%     |
| Isolated Chipped Stone                  | 8  | 5            | 10            | 0             | 0                           | 15<br>7.4%    |
| Groundstone-Sherds                      | 9  | 0            | 0             | 1             | 1                           | 2<br>1.0%     |
| Groundstone Only                        | 10 | 1            | 4             | 0             | 2                           | 7<br>3.4%     |
| Rubs Only                               | 11 | 0            | 0             | 1             | 0                           | 1<br>0.5%     |
| Sherd Scatter                           | 12 | 2            | 1             | 0             | 1                           | 4<br>2.0%     |
| Isolated Sherd                          | 13 | 7            | 3             | 5             | 1                           | 16<br>7.9%    |
| Roasting Pit with no or One Artifact    | 14 | 4            | 38            | 28            | 18                          | 88<br>43.3%   |
| Roasting Pit with Rubs and/or Sherds    | 15 | 1            | 1             | 1             | 1                           | 4<br>2.0%     |
| Rockshelter with Sherds-Lithics-Milling | 16 | 1            | 1             | 1             | 0                           | 3<br>1.5%     |
| Rockshelter with Ceremonial Functions   | 18 | 0            | 0             | 2             | 1                           | 3<br>1.5%     |
| Pictograph                              | 19 | 0            | 0             | 0             | 1                           | 1<br>0.5%     |
| Rockwall                                | 20 | 0            | 1             | 0             | 0                           | 1<br>0.5%     |
| Groundstone-Chipped Stone               | 21 | 1            | 1             | 0             | 0                           | 2<br>1.0%     |
| Cupules                                 | 22 | 0            | 2             | 0             | 0                           | 2<br>1.0%     |
| COLUMN TOTALS                           |    | 46<br>22.7%  | 86<br>42.4%   | 44<br>21.7%   | 27<br>13.3%                 | 203<br>100.0% |



TABLE 23  
Presence/Absence of Sites by Slope

|               | 0-10 | 11-30 | 31-50 | 50+ |    |
|---------------|------|-------|-------|-----|----|
| Sites Absent  | 4    | 4     | 3     | 4   | 15 |
| Sites Present | 9    | 6     | 2     | 7   | 24 |
|               | 13   | 10    | 5     | 11  | 39 |

$\chi^2 = 1.34$   
Significance = .719

TABLE 24  
Presence/Absence of Temporary Camps by Slope

|               | 0-10 | 11-30 | 31-50 | 50+ |    |
|---------------|------|-------|-------|-----|----|
| Camps Absent  | 8    | 9     | 4     | 8   | 29 |
| Camps Present | 5    | 1     | 1     | 3   | 10 |
|               | 13   | 10    | 5     | 11  | 39 |

$\chi^2 = 2.50$   
Significance = .475



TABLE 25

## Presence/Absence of Temporary Camps by Transect Slope

|                 |   | <u>11-30%<br/>Slope</u> | <u>31-50%<br/>Slope</u> | <u>50+%<br/>Slope</u> | <u>Row<br/>Total</u> | (A) VALLECITO-CANEBRAKE<br>Mountain                                                   |
|-----------------|---|-------------------------|-------------------------|-----------------------|----------------------|---------------------------------------------------------------------------------------|
| Absence         | 0 | 3                       | 1                       | 2                     | 6                    | Raw Chi Square = 2.66667<br>with<br>2 Degrees of Freedom<br><br>Significance = 0.2636 |
| Presence        | 1 | 0                       | 0                       | 2                     | 2                    |                                                                                       |
| Column<br>Total |   | 3                       | 1                       | 4                     | 8                    |                                                                                       |

|                 |   | <u>0-10%<br/>Slope</u> | <u>11-30%<br/>Slope</u> | <u>Row<br/>Total</u> | (B) VALLECITO-CANEBRAKE<br>Desert Valley |
|-----------------|---|------------------------|-------------------------|----------------------|------------------------------------------|
| Absence         | 0 | 8                      | 1                       | 9                    | Fisher's Exact Test =<br>0.56250         |
| Presence        | 1 | 7                      | 0                       | 7                    |                                          |
| Column<br>Total |   | 15                     | 1                       | 16                   |                                          |

|                 |   | <u>0-10%<br/>Slope</u> | <u>31-50%<br/>Slope</u> | <u>50+%<br/>Slope</u> | <u>Row<br/>Total</u> | (C) MCCAIN<br>Mountain                                                                |
|-----------------|---|------------------------|-------------------------|-----------------------|----------------------|---------------------------------------------------------------------------------------|
| Absence         | 0 | 1                      | 1                       | 4                     | 6                    | Raw Chi Square = 2.91667<br>with<br>2 Degrees of Freedom<br><br>Significance = 0.2326 |
| Presence        | 1 | 0                      | 1                       | 0                     | 1                    |                                                                                       |
| Column<br>Total |   | 1                      | 2                       | 4                     | 7                    |                                                                                       |

|                 |   | <u>0-10%<br/>Slope</u> | <u>11-30%<br/>Slope</u> | <u>Row<br/>Total</u> | (D) MCCAIN<br>Mountain Valley |
|-----------------|---|------------------------|-------------------------|----------------------|-------------------------------|
| Absence         | 0 | 13                     | 2                       | 15                   | Fisher's Exact Test = 0.50088 |
| Presence        | 1 | 4                      | 1                       | 5                    |                               |
| Column<br>Total |   | 17                     | 3                       | 20                   |                               |

|                 |   | <u>0-10%<br/>Slope</u> | <u>50+%<br/>Slope</u> | <u>Row<br/>Total</u> | (E) MCCAIN<br>Canyon          |
|-----------------|---|------------------------|-----------------------|----------------------|-------------------------------|
| Absence         | 0 | 3                      | 0                     | 3                    | Fisher's Exact Test = 0.25000 |
| Presence        | 1 | 0                      | 1                     | 1                    |                               |
| Column<br>Total |   | 3                      | 1                     | 4                    |                               |

|                 |   | <u>0-10%<br/>Slope</u> | <u>11-30%<br/>Slope</u> | <u>Row<br/>Total</u> | (F) TABLE MOUNTAIN<br>Mountain |
|-----------------|---|------------------------|-------------------------|----------------------|--------------------------------|
| Absence         | 0 | 2                      | 1                       | 3                    | Fisher's Exact Test = 0.42357  |
| Presence        | 1 | 4                      | 0                       | 4                    |                                |
| Column<br>Total |   | 6                      | 1                       | 7                    |                                |



## Landform

The presence or absence of sites by landform strata was examined above (Density Estimates); landform did not differentiate site type frequencies. In other words, the proportion of transects with sites was fairly uniform over all strata. However, a visual examination of transects on U.S.G.S. 7.5 minute quadrangles showed that the difficulties associated with generalizing transect slope were also critical when generalizing transect landform descriptions. Transects frequently crosscut strata; that is, although a transect may have been designated as lying within a mountain stratum, the sites may have been located at the interface of a mountain and valley system. To control this variability within landform strata, transects were labeled "pure" or "crosscutting": "pure" transects were situated entirely within the designated strata; "crosscutting" transects encompassed a combination of landform types. Seven categories were established:

|                              |        |              |
|------------------------------|--------|--------------|
| (1) Mountain                 | _____) | Pure         |
| (2) Mountain Valley          | )      |              |
| (3) Canyon                   | _____) |              |
| (4) Desert Valley            | _____) | Crosscutting |
| (5) Mountain-Mountain Valley | )      |              |
| (6) Mountain-Canyon          | )      |              |
| (7) Mountain-Desert Valley   | _____) |              |

The generic name given to the restratification was Strat3.

A cross-tabulation of site presence or absence by Strat3 using Stage I and II data is in Table 26. The table shows the distribution of transects and sites among the various strata. Cross-cutting transects represent nearly 29% of the sample (20 out of 69 transects). The higher density of sites in cross-cutting strata is important; 80% of crosscutting transects have sites compared to 65% for pure strata. The Vallecito-Canebrake section has the highest proportion of crosscutting strata, an average of 42%. The McCain Valley section has 31% crosscutting; and Table Mountain contains no crosscutting strata.

This illustrates a major problem in landform analysis in this area. It was difficult to isolate particular landform types within operational structures since transects were cadastrally selected. Designated strata (landform types) were misrepresentative, since there were a large number of crosscutting strata. Compounding this problem is the anomaly of Table Mountain, designated as a mountain stratum, but with a unique geologic configuration and mountain valley landform. Analysis conducted on the basis of landform must be evaluated cautiously: landform categories should not be analyzed in a general mode, such as testing for the presence or absence of



sites by all mountain, mountain valley, canyon, and desert valley strata. Localized regional analysis, such as that conducted above (Density Estimates), is a more appropriate type of analysis.

A partial correction for some errors of transect landform analysis is site specific analysis, i.e., the distribution of sites with respect to specific landform features, from which differences between various site types and their locations with respect to terrain can be examined. This should also serve to clarify the results of the slope analysis presented above.

Two measures of site specific landform were encoded, scaling elevation changes between a site location and four points at the perimeters of regular 40-acre and 640-acre spatial frames. This is the Hammond classification system as applied for SARG (Plog et al., 1978:179). The technique was experimental; it was intended to systematize and quantify definitions of landform features throughout the area. Its application required setting both a spatial frame size and an appropriately weighted minimum change in surrounding elevation to describe variability in relief. It was not clear, a priori, what level of relief would be most useful for analysis, so the values initially selected were arbitrary. As Plog notes,

There has probably been no more continuous investigation and reinvestigation of a specific variable during the history of SARG than the efforts focused on landform . . . . Developing some standardized, not to mention comparable basis for these terms has proven impossible. On the one hand there has never been any standardized definition of such terms employed in archaeology. On the other, on close inspection, geographers currently prove to be quite reluctant to supply tidy definitions for them . . . . SARG participants (who) have felt that local landforms are (a) highly significant resources in and of themselves and (b) good indicators of critical combinations of other resources. Perhaps the conviction that this variable will prove important is incorrect, but most of us felt that our problems in dealing with the landform issue had less to do with the absence of a relationship than with poor variable definition (1978:179-180).

The results of landform scaling are in Tables 27 and 28. For Landform I, most sites were scaled as in flat terrain, as would be intuitively expected. The second most frequent terrain aspect was side slope; this is due mainly to the locations of roasting pits, the most numerous site type in the sample. Type 2 temporary camps were found in two predominant aspects: valley bottom or flat (45%), and base of slope or



rise edge (35%). Other sites with milling attributes have a similar pattern. Distinct from these are lithic scatters and the tentatively reclassified larger type 2 sites (IV-IVBP above), 80% of which are found in flat terrain. These results are only roughly comparable to earlier slope data, as up to 15% slope was possible within "flat" terrain.

Regional distributions were also evaluated. Desert valley landforms contrast with flat alluvial valleys circumscribed by steep mountain slopes. McCain Valley and Table Mountain are dissected plateau/mesas of less dramatic relief with landform features at a smaller scale. Table 27 presents regional Landform I values for type 2 camps and all site types combined. For the overall distribution, a greater percentage of sites are scaled as flat in McCain Valley and Table Mountain than in the Vallecito-Canebrake section, where base of slope or edge of rise values are as frequent as flat values. Type 2 sites in McCain Valley and Vallecito-Canebrake are evenly divided between flat and slope base/rise edge, which is interesting in respect to the overall McCain Valley results -- of the total eight sites in this aspect, five are type 2. The sample size and number of categories limits the power of any statistical test, but this result suggests some selectivity of activity areas across regions. Inspection of mapped site locations confirms that sites tend to cluster at the mountain/valley interface in desert regions, while in other areas the locations are more variable. The scaling technique used does not express this clearly, and further refinement is needed to effectively apply the technique to the area.

Landform II was scaled over a broader area (640 acres) and provides more generalized descriptions of terrain. Distribution of both camps and other site types shifts from predominantly flat areas to a more even distribution, including ridge features, side slopes, and bases of mountains. These findings concur with observations of the mapped locations of sites; but comparing results of both areal frame sizes, a 1 km<sup>2</sup> frame might have been a more effective level to apply. The diversity of site settings for sites throughout the area is more significant than any particular association of landform types to given classes of features or overall density of sites.

In summary, sites are located in varying landform settings and degrees of severity of terrain, thus supporting the results of the density estimates. Most sites are in areas of slope from 0 to 35%, but many are found at up to 50% slope. In a specific sense, sites are situated in level areas, but the number of sites occurring on small flats within rugged landforms does not support the identification of steep or complex areas as zones of significantly lower densities. The relevant level area around a site may vary from a few square meters for roasting pits, to forty acres for complex habitation sites along mountain slopes. Effective areas upon which to stratify



TABLE 26  
 Presence/Absence of Sites by Re-Classified Landform Strata (Strat3)  
 (Stage 1 and Stage 2 Data)

|               | <u>PURE</u>     |                        | <u>CROSSCUTTING</u> |                      |                                      |                             |                                    |
|---------------|-----------------|------------------------|---------------------|----------------------|--------------------------------------|-----------------------------|------------------------------------|
|               | <u>Mountain</u> | <u>Mountain Valley</u> | <u>Canyon</u>       | <u>Desert Valley</u> | <u>Mountain-<br/>Mountain Valley</u> | <u>Mountain-<br/>Canyon</u> | <u>Mountain-<br/>Desert Valley</u> |
| Sites Absent  | 9               | 5                      | 0                   | 3                    | 2                                    | 0                           | 2                                  |
| Sites Present | 16              | 12                     | 0                   | 4                    | 2                                    | 6                           | 8                                  |
| TOTAL         | 25              | 17                     | 0                   | 7                    | 4                                    | 6                           | 10                                 |
|               |                 |                        |                     |                      |                                      |                             | 21                                 |
|               |                 |                        |                     |                      |                                      |                             | 48                                 |
|               |                 |                        |                     |                      |                                      |                             | 69                                 |



TABLE 27

## SITE LANDFORM I BY REGION

## STAGE I AND II DATA

|                          | FLAT | KNOLL | RISE EDGE | SLOPE BASE | SADDLE | CONFINED RIDGE | RIDGE | SIDE SLOPE | CANYON | TOTALS |
|--------------------------|------|-------|-----------|------------|--------|----------------|-------|------------|--------|--------|
| Vallecitos-<br>Canebrake |      |       |           |            |        |                |       |            |        |        |
| Type 2                   | 5    |       |           | 5          |        | 1              |       | 1          |        | 12     |
| All Sites                | 19   | 5     | 3         | 19         | 4      | 10             | 2     | 24         | 7      | 93     |
| McCain                   |      |       |           |            |        |                |       |            |        |        |
| Type 2                   | 4    |       | 2         | 3          |        |                |       | 1          | 1      | 11     |
| All Sites                | 37   | 2     | 3         | 5          |        | 5              |       | 20         | 2      | 74     |
| Table Mtn.               |      |       |           |            |        |                |       |            |        |        |
| Type 2                   | 4    |       |           |            |        | 1              | 1     |            |        | 6      |
| All Sites                | 26   | 1     |           | 1          | 1      | 4              | 1     | 1          |        | 35     |
| Total Type 2             | 13   |       | 2         | 8          |        | 2              | 1     | 2          | 1      | 29     |
| Total All                | 82   | 8     | 6         | 25         | 5      | 19             | 3     | 45         | 9      | 202    |



TABLE 28

Site Type by 40 Acre Landform

|                               |    | Flat<br>(Valley) | Knoll | Rise<br>Edge | Slope<br>Base | Saddle | Confined<br>Ridge | Ridge | Slope | Canyon | Row<br>Total |
|-------------------------------|----|------------------|-------|--------------|---------------|--------|-------------------|-------|-------|--------|--------------|
| Temporary Camp                | 2  | 13               | 0     | 2            | 8             | 0      | 2                 | 1     | 2     | 1      | 29<br>14.4%  |
| Large Sherd-Lithic<br>Scatter | 3  | 4                | 0     | 0            | 1             | 1      | 0                 | 0     | 0     | 0      | 6<br>3.0%    |
| Small Sherd-Lithic<br>Scatter | 4  | 6                | 0     | 0            | 1             | 0      | 0                 | 0     | 0     | 0      | 7<br>3.5%    |
| Large Light Lithic<br>Scatter | 5  | 1                | 0     | 0            | 1             | 0      | 0                 | 0     | 0     | 0      | 2<br>1.0%    |
| Small Dense Lithic<br>Scatter | 6  | 2                | 0     | 0            | 0             | 0      | 0                 | 0     | 0     | 0      | 2<br>1.0%    |
| Small Light Lithic<br>Scatter | 7  | 7                | 1     | 0            | 0             | 0      | 0                 | 0     | 0     | 0      | 8<br>4.0%    |
| Isolated Chipped<br>Stone     | 8  | 15               | 0     | 0            | 0             | 0      | 0                 | 0     | 0     | 0      | 15<br>7.5%   |
| Groundstone-Sherds            | 9  | 0                | 0     | 0            | 1             | 0      | 0                 | 0     | 0     | 1      | 2<br>1.0%    |
| Groundstone Only              | 10 | 2                | 1     | 0            | 2             | 0      | 0                 | 0     | 1     | 1      | 7<br>3.5%    |
| Rubs Only                     | 11 | 0                | 0     | 0            | 0             | 1      | 0                 | 0     | 0     | 0      | 1<br>0.5%    |



for presence or absence of sites are less than 40 acres in size, which is probably too small for general use. While it is likely that more large sites are situated at valley/mountain interfaces, especially in desert valleys, it is apparent that other variables such as distance to water, discussed below, were of equal or greater importance for influencing location.

### Vegetation

Late prehistoric subsistence focused on the gathering of plant resources. As the current distribution of flora is assumed to be representative of that period, the relationship of site types to communities and specific genera of vegetation is of considerable interest. However, most species used are not stable in local frequency or density, and the technology used to extract and process species is generalized. Heavily exploited resources such as sage, chia, yucca, and agave, occur in various communities in variable density and frequency, and cannot be expected to remain associated with site locations for a long period of time. Since the principal exploitative technology seems to be adaptation to a wide variety of areas and food sources, it is difficult to rank plant communities with expected densities of site types, except for stable sources such as oak or pinyon, which are not represented in the study area to any significant extent. Of sites recorded, 70% exhibit some direct evidence of vegetal extraction, processing, or preparation.

Previous studies have found vegetation a weak discriminant of site distribution (cf. Weide and Barker, 1974; Wells, 1977; Ritter, 1976). As Ritter summarized:

- (1) ethnographic data do not suggest significant variation in adaptation by vegetation zone in the area,
- (2) significant shifts in vegetation zones and types may have occurred during and/or since aboriginal occupation (in Wells, 1977:4).

The distribution of sites to vegetal communities and specific genera was analyzed as a further test of these assumptions and earlier results. Vegetation was scaled from a generalized community map provided by BLM (URA Step II), and from field observations of particular genera that could be reliably recognized by the field crews. These include prunus, rhus, opuntia, yucca, agave, quercus, and riparian associations. In addition, a graze map prepared by BLM was evaluated, but its 60 communities were found to be too complex a stratification and emphasized modern forbs and grasses rather than native shrubs.

The association of vegetal community to the presence or absence of sites was examined for each section. As all vegetation types were not in each stratum, the results could



not be pooled to provide regional associations. However, Stage I transects were selected proportionately to stratum area and they can be considered randomly selected from the combined study area.

Table 29 contains data from Stage I transects for the entire study area giving the presence or absence of sites by vegetation. The hypothesis tested was non-directional; interest lay only in testing whether site presence is positively or negatively associated, or independent of vegetal community. Although the chi square  $p=1.43$  is quite large, a comparison of expected and observed values shows a disproportionate absence of sites in chaparral, with an unexpectedly high number of sites in upland scrub. To test whether these disparities are significant, a test on the residuals was conducted (Haberman, 1973:205). The adjusted residuals approximate normal distributions, and are tested against a value of  $\pm 1.96$ . When a residual is larger than 1.96 or less than  $-1.96$ , it is significant at  $p=0.05$ . For example, for chaparral a value of  $-1.99$  is observed. Since the category of sites present by chaparral has a residual of  $-1.99$ , the conclusion is that significantly fewer sites were observed in that category than expected under the assumption of independence. A value of  $+1.96$  for sites present by upland scrub shows significantly more (at  $p=0.0536$ ) sites present in upland scrub than expected.

There is, therefore, evidence of association between presence of sites and certain vegetation communities. This conclusion must be approached with some caution, however. Most transects in chaparral were in mountain strata. These transects were not only the most difficult to survey but low ground surface visibility introduced difficulties in locating small low density sites. Other factors, such as landform, may also have influenced this particular distribution. The high presence of sites in upland scrub does not appear to be a function of any specific site type as further analysis with transect data did not reveal any one site type having a significantly higher presence in upland scrub than in other vegetal communities.

Regional analyses are in Table 30. There is no significant association between site presence and vegetal community in any particular strata. However, where upland scrub is present in a given stratum, the proportion of sites is often higher within the upland scrub than other vegetal communities. Thus, the conclusion that the upland scrub community has a higher proportion of transects with sites is supported, though further testing is necessary to confirm this.

Field records of specific economic plants provided a basis to test for site presence or absence and the presence or absence of specific plant genera, including prunus, rhus,



TABLE 29

THE PRESENCE/ABSENCE OF SITES BY VEGETATION

|               | <u>Chapparal</u> | <u>Desert<br/>Chapparal</u> | <u>Lowland<br/>Scrub</u> | <u>Upland<br/>Scrub</u> |    |
|---------------|------------------|-----------------------------|--------------------------|-------------------------|----|
| Sites Absent  | 6 (3.46)         | 3 (2.31)                    | 2 (2.31)                 | 4 (6.92)                | 15 |
| Sites Present | 3 (5.54)         | 3 (3.69)                    | 4 (3.69)                 | 14 (11.08)              | 24 |
|               | 9                | 6                           | 6                        | 18                      | 39 |

NOTE: EXPECTED NUMBER IN EACH CATEGORY IS IN PARENTHESIS  
 THE CALCULATED  $\chi^2$  VALUE IS 5.43, WITH SIGNIFICANCE=.143

| <u>Standardized Residuals</u> |      |      |       | <u>Variance<br/>Standardized Residuals</u> |     |     |     |
|-------------------------------|------|------|-------|--------------------------------------------|-----|-----|-----|
| 1.37                          | .45  | -.20 | -1.11 | .47                                        | .52 | .52 | .33 |
| -1.08                         | -.36 | .16  | .88   | .30                                        | .33 | .33 | .21 |

| <u>Adjusted Residuals</u> |      |      |       |
|---------------------------|------|------|-------|
| 1.99                      | .62  | -.28 | -1.93 |
| -1.99                     | -.62 | .28  | 1.93  |

COMPARE TO z VALUE OF 1.96 TO LOCATE SIGNIFICANT RESIDUALS



TABLE 30

Presence/Absence of Sites by Vegetation Community

|                 | <u>Desert<br/>Chapparal</u> | <u>Lowland<br/>Scrub</u> | <u>Upland<br/>Scrub</u> | <u>Row<br/>Total</u> | (A) VALLECITO-CANEBRAKE<br>Mountain                                               |
|-----------------|-----------------------------|--------------------------|-------------------------|----------------------|-----------------------------------------------------------------------------------|
| Absence 0       | 0                           | 0                        | 1                       | 1                    | Raw Chi Square = 0.68571<br>with<br>2 Degrees of Freedom<br>Significance = 0.7097 |
| Presence 1      | 2                           | 1                        | 4                       | 7                    |                                                                                   |
| Column<br>Total | 2                           | 1                        | 5                       | 8                    |                                                                                   |

|                 | <u>Lowland<br/>Scrub</u> | <u>Upland<br/>Scrub</u> | <u>Row<br/>Total</u> | (B) VALLECITO-CANEBRAKE<br>Desert Valley |
|-----------------|--------------------------|-------------------------|----------------------|------------------------------------------|
| Absence 0       | 4                        | 1                       | 5                    | Fisher's Exact Test =<br>0.54167         |
| Presence 1      | 10                       | 1                       | 11                   |                                          |
| Column<br>Total | 14                       | 2                       | 16                   |                                          |

|                 | <u>Chapparal</u> | <u>Desert<br/>Chapparal</u> | <u>Upland<br/>Scrub</u> | <u>Row<br/>Total</u> | (C) McCAIN<br>Mountain                                                            |
|-----------------|------------------|-----------------------------|-------------------------|----------------------|-----------------------------------------------------------------------------------|
| Absence 0       | 1                | 1                           | 1                       | 3                    | Raw Chi Square = 1.89583<br>with<br>2 Degrees of Freedom<br>Significance = 0.3875 |
| Presence 1      | 0                | 1                           | 3                       | 4                    |                                                                                   |
| Column<br>Total | 1                | 2                           | 4                       | 7                    |                                                                                   |

|                 | <u>Chapparal</u> | <u>Desert<br/>Chapparal</u> | <u>Upland<br/>Scrub</u> | <u>Row<br/>Total</u> | (D) McCAIN<br>Mountain Valley                                                      |
|-----------------|------------------|-----------------------------|-------------------------|----------------------|------------------------------------------------------------------------------------|
| Absence 0       | 3                | 2                           | 2                       | 7                    | Raw Chi Square = 0.13393<br>with<br>2 Degrees of Freedom<br>Significance = 0.93522 |
| Presence 1      | 5                | 4                           | 5                       | 14                   |                                                                                    |
| Column<br>Total | 8                | 6                           | 7                       | 21                   |                                                                                    |

|                 | <u>Desert<br/>Chapparal</u> | <u>Lowland<br/>Scrub</u> | <u>Upland<br/>Scrub</u> | <u>Row<br/>Total</u> | (E) McCAIN<br>Canyon            |
|-----------------|-----------------------------|--------------------------|-------------------------|----------------------|---------------------------------|
| Absence 0       | 0                           | 0                        | 0                       | 0                    | Fisher's Exact Test =<br>1.0000 |
| Presence 1      | 1                           | 1                        | 2                       | 4                    |                                 |
| Column<br>Total | 1                           | 1                        | 2                       | 4                    |                                 |

|                 | <u>Desert<br/>Chapparal</u> | <u>Upland<br/>Scrub</u> | <u>Row<br/>Total</u> | (F) TABLE MOUNTAIN<br>Mountain  |
|-----------------|-----------------------------|-------------------------|----------------------|---------------------------------|
| Absence 0       | 0                           | 0                       | 0                    | Fisher's Exact Test =<br>1.0000 |
| Presence 1      | 2                           | 5                       | 7                    |                                 |
| Column<br>Total | 2                           | 5                       | 7                    |                                 |



acacia, yucca, agave, chia, sage, beavertail, and juniper. Prior to comparison with site type distributions, the distribution of these specific plants by region and vegetal community was studied. No particular vegetation community was isolated that is highly correlated with the presence or absence of any specific genera, except agave in the enriched desert scrub community. Further studies using cattle graze maps also proved fruitless. In subsequent analyses, plant type was considered independent of vegetal community. (Note: In the field only the presence or absence of plant type was recorded, so the available information is crude. There are associations between plants and vegetative communities; however, with the scaling used the differences could not be demonstrated statistically.)

Results of initial computer runs suggested that site presence and economic plant distribution were independent. However, when testing only the presence or absence of site type 2, it was found that camps were associated with prunus, particularly in the McCain Valley mountain valley stratum, as illustrated in Table 31.

TABLE 31

Presence/Absence of Temporary Camps by Prunus Within the  
McCain Mountain Valley Stratum

| <u>Site Type 2</u> | <u>PRUNUS</u> |                |    |
|--------------------|---------------|----------------|----|
|                    | <u>Absent</u> | <u>Present</u> |    |
| Absent             | 9             | 4              | 13 |
| Present            | 1             | 5              | 6  |
|                    | 10            | 9              | 19 |

$$p = .04954 \quad \phi = .48935$$

No other distinct associations were found between specific plants and the presence or absence of site types for transect data.

Next, site specific analysis of associations between site types and vegetation was conducted using both base maps and field encoded information. The association between site types and general vegetal community was examined for each section. Consistent with the general transect analysis, no unusual or inexplicable relationships were found. Site type was independent of vegetal community, except for roasting pits, as evidenced by their prevalence in enriched desert scrub



(mountain areas).

As anticipated, the association of agave and roasting pits was extremely high; for the first two stages of the survey 83 of 88 roasting pits (94%) had agave present. Other plant genera were not as obviously associated with a specific type. However, in regionally based analysis, several associations did appear. The association of type 2 camps to prunus within the McCain Valley mountain valley system was again noted. The site data results are presented in Table 32.

TABLE 32

|                        | <u>Prunus Absent</u> | <u>Prunus Present</u> |    |
|------------------------|----------------------|-----------------------|----|
| Site Type 2<br>(camps) | 23                   | 11                    | 34 |
| Other Types            | 1                    | 7                     | 8  |
|                        | 24                   | 18                    | 42 |
| $\chi^2 = 5.984$       | $p = .0147$          | $\phi = .43759$       |    |

Milling as a component was also tested and found to have associations. Difficulties were encountered in interpreting the test results, as in desert areas the "other types" category included many roasting pits, which were in negative association to plant genera other than agave. Tests eliminating the effects of roasting pits reduced the levels of association to non-significant levels in these areas. Prunus is mentioned by Bean's informants (1972:43) as a favored food source which required processing (milling) for consumption but its relative contribution to total dietary intake was probably low overall. It was suspected that the association of prunus with type 2 (camps and milling) may have been a function of water presence; that is, prunus itself is found only in well-watered areas along stream beds and springs. However, in tests prunus was not found directly associated with any water source.

Analysis of the distribution of sites to both communities and specific genera of plants met with only mild success. Mountainous chaparral areas and lowland desert valley creosote scrub communities had lower site densities overall. Transitional and heterogeneous upland desert scrub community had slightly higher densities of sites; but densities or type distributions were not markedly different for desert scrub as opposed to the transitional chaparral communities which comprise most of the study area. Though scaling of genera and species was weak, and may have been more effective if pursued in greater detail, similarities between areas, and the lack of associations between site types or components and particular genera or



communities support the results of other studies: vegetation is not a sensitive indicator of site location.

### Hydrology

Water is a critical resource for living in a semi-arid environment. General climatic trends have been frequently posited as a key factor in the level of human occupation of the area over time (cf. Wilke, 1973; Weide, 1973; Wallace, 1962a; Kowta, 1969). Given a relatively low energy investment in resource redistribution or major storage technology by late prehistoric peoples, it is expected that activities that require water consumptions in quantity will be associated with available water sources. As example is the density of sites around the Lake Cahuilla shoreline, illustrating the direct locational response to and maximization of the resource potential of a major hydrologic feature.

Testable implications are posited for site type distributions in the study area. Residential areas, or areas of group habitation of even a short duration are expected to be situated near or adjacent to water sources. Collection and processing areas for resources such as oak, prunus, or mesquite should also exhibit an association, due both to the natural habitat of the plants, and the use of water to prepare them for consumption. More limited resource procurement or processing activity areas are expected to fluctuate widely in the relation of spatial distribution to hydrologic features.

Larger, more complex camps, with features such as milling, midden, and other habitational debris, and large complexes of milling features, are expected to be nearest water sources. Small lithic or ceramic scatters and sites related to the extraction or processing of agave, yucca, or sage, such as roasting pits and isolated milling areas, are not expected to exhibit the same level of association. Absolute distance is not as critical as the relative consistency of distance within and between classes. Values for absolute distance to source features by site types were approximated in Wells' (1977) survey of Davies Valley. Her data indicate that site type densities segregate out within and beyond a distance from .25 to .5 kilometers from streams or springs.

Two difficulties in testing these implications are relating specific site morphology to activities, and measuring water source availability. Bean, in his ethnographic studies of Cahuilla peoples whose habitats are roughly comparable, has emphasized the problems of source availability endemic to the area. His informants mention the sudden desiccation of direct surface sources owing to climatic fluctuation and seismic events. The desiccation caused the abandonment of traditional settlements and population relocation (1972:33). Recent mapping of surface and subsurface water flow or volume may not adequately reflect even a thousand-year span for the area; so



existing sources are not a reliable measure of prehistoric conditions. Given the limited resources available, drainage morphology was used to represent water source availability. A stream rank scale to measure spatial association and site densities was based upon U.S.G.S. mapped features classed as either Rank I (initial branch), Rank II (confluence of at least two Rank I's), or above (cf. Plog et al., 1978; Wells, 1977).

The initial test requirement was to set an average mean distance for the sample as a base from which to compare various site types. If specific site types are in association (e.g. type 2's are on water courses), water could be inferred as a major factor; but a range of values of all types was observed. The analysis further tested to determine if any types were situated closer than the average value for the sample (i.e. the average mean for all transects sampled), and the probability of these differences occurring from chance. Unweighted site specific distances for each type (e.g. average of all type 2's or all roasting pits) were also of interest as a descriptive characterization of site locations.

During the survey, the presence or absence of surface water was noted for all sites and transects, as well as source type. Since the survey was conducted in spring, after the rainy season, observed occurrences reflected subsurface discharge after ground saturation, and to some degree runoff from the Peninsular Range summit. Since the Stage I sample was taken proportionally from all areas, the number of transects with surface water is an estimator for occurrences for the entire sample region. Stage II data were also used for areas of specific interest: McCain Valley, Vallecito-Canebrake, and Table Mountain. Some Stage III transects were in part selected to sample areas with particular hydrologic features, and their use would bias the distribution of types of drainage features or numbers of transects with water included across the sample. But because the transects were not selected on the basis of known site locations, the formal characteristics of sites by their spatial relationship to hydrologic features may still be evaluated with this data.

An initial test of the relationships of hydrology to water is the presence/absence of sites within transects by source feature type, and by the presence/absence of surface water, presented below.



## Distribution of Water Source Features by Site Occurrence

Transect: Stages I, II Data

|               | <u>No Water<br/>Source</u> | <u>Rank I<br/>Stream</u> | <u>Rank II<br/>Stream</u> | <u>Rank III<br/>Stream</u> | <u>Spring</u> |      |
|---------------|----------------------------|--------------------------|---------------------------|----------------------------|---------------|------|
| Sites Present | 12                         | 20                       | 2                         | 2                          | 2             | 48   |
| Sites Absent  | 5                          | 13                       | 0                         | 0                          | 0             | 21   |
|               | 17                         | 33                       | 2                         | 2                          | 2             | 69   |
|               | 24.6%                      | 47.8%                    | 2.9%                      | 2.9%                       | 2.9%          | 100% |

## Water on Transect by Site

|               | <u>No Water</u> | <u>Water Present</u> |    |
|---------------|-----------------|----------------------|----|
| No Sites      | 16              | 5                    | 21 |
| Sites Present | 37              | 11                   | 48 |
|               | 53              | 16                   | 69 |

From inspection of the data, there is no apparent relationship between occurrence of sites and either water feature type or presence of surface water. However, an inherent weakness of this test is that only water sources within a transect are recorded while any springs or streams lying outside transect boundaries were not included. To alleviate this problem, distribution of site types by actual distance to water and sources was examined. Because transects were randomly chosen, the distance from the center of each transect to the nearest drainage feature of each type was used to estimate this distribution. Distances to hydrology features for transects with sites were compared to distances to water for transects without sites. Significant differences would indicate that drainage patterns and springs may be important discriminants in predicting site locations.

Prior to formal testing, the normality assumptions underlying the parametric tests, in particular the t-test, were closely examined. The distribution of distance to water sources was plotted and tested for normality. Distributions were found to be skewed, thus the non-parametric Mann-Whitney U test was used as an alternative to the t-test. The normality



problem arose due to the small number of transects within each section, and the sensitivity of the t-test to normality assumptions when sample sizes are extremely small. Since the Mann-Whitney U test is quite powerful, and is an exact test regardless of sample size, its use was appropriate. In each test the null and alternate hypotheses were:

$H_0$ : The distances to Rank II streams are the same for transects with and without sites.

$H_A$ : Transects with sites (or specific types) have stream distances less than those transects without sites (or types).

Column 1 in Tables 33 and 34 contain median distances to Rank I and Rank II (or higher) streams for transects with or without sites. The medians are approximately the same, indicating that site presence is not characterized by distance to stream features. Also, since the median distance for transects with sites was often greater than transects without sites, the directional hypothesis,  $H_A$  (transects with sites have stream distances less than those transects without sites), can be rejected without further testing.

It was expected that habitational sites were likely to be situated near water sources; sufficient numbers of transects had camps, allowing a test of that expectation. The distance to stream features for transects with type 2 sites is presented in Table 34. The median distance to Rank II streams is always less for transects with temporary camps than for those without. Individual Mann-Whitney U tests within each stratum (regional section) show that the distances are significantly less ( $\alpha = .05$ ) for transects with camps within the Vallecito-Canebrake mountain stratum. However, since distances for transects with camps are consistently less than those transects without camps within each sampled area, an overall probability was calculated. Let  $y = -2\sum(\ln p_i)$  where each  $p_i$  is the calculated probability from the Mann-Whitney U tests from each stratum. In this case,  $y = -2 (\ln(.3724) + \ln(.01) + \ln(.1428) + \ln(.1959) + \ln(.2764)) = 20.91$ . This value of  $y$  is compared to a  $\chi^2$  value with  $2 \times 5 = 10$  degrees of freedom.  $P \chi^2_{10} > 20.91 = .023$ . Therefore, there is significant evidence that distances to Rank II streams for transects without camps is greater than for those with camps. Temporary camp locations may be a function of the distance from Rank II (or higher) streams.

An additional test of this relationship compares the frequency of occurrence of type 2 camps within transects containing various stream features, as the median distance is low enough to be compatible with the transect area.



TABLE 33  
Median Distance to Rank 1 Streams

| <u>REGION/STRATUM</u> | <u>COLUMN 1</u>      |                       | <u>COLUMN 2</u>      |                       |
|-----------------------|----------------------|-----------------------|----------------------|-----------------------|
|                       | <u>Absence Sites</u> | <u>Presence Sites</u> | <u>Absence Sites</u> | <u>Presence Sites</u> |
| Vallecito-Canebrake   |                      |                       |                      |                       |
| Mountain              | 0                    | .50                   | .50                  | .80                   |
| Desert Valley         | .20                  | .50                   | .55                  | .15                   |
| McCain                |                      |                       |                      |                       |
| Mountain              | .30                  | .25                   | .20                  | .20                   |
| Mountain Valley       | .30                  | .35                   | .30                  | .30                   |
| Table Mountain        |                      |                       |                      |                       |
| Mountain              | **                   | .10                   | .10                  | .35                   |

\*\*All Table Mountain transects contained sites.



TABLE 34  
Median Distance to Rank 2 (or higher) Streams

| <u>REGION/STRATUM</u> | COLUMN 1             |                       | COLUMN 2             |                       |
|-----------------------|----------------------|-----------------------|----------------------|-----------------------|
|                       | <u>Absence Sites</u> | <u>Presence Sites</u> | <u>Absence Camps</u> | <u>Presence Camps</u> |
| Vallecito-Canebrake   |                      |                       |                      |                       |
| Mountain              | .88                  | .85                   | .88                  | .31                   |
| Desert Valley         | .35                  | .36                   | .50                  | .31                   |
| McCain                |                      |                       |                      |                       |
| Mountain              | 1.05                 | .90                   | .99                  | .28                   |
| Mountain Valley       | 1.12                 | 1.21                  | 1.23                 | .90                   |
| Table Mountain        |                      |                       |                      |                       |
| Mountain              | **                   | .80                   | .81                  | .51                   |

\*\* All Table Mountain transects contained sites.



TABLE 35

Water Feature to P/A site Type 02 (Stages I and II)

| <u>Site Type 02</u>         | <u>No Water<br/>Source</u> | <u>Rank I</u> | <u>Rank II<br/>or springs</u> |    |
|-----------------------------|----------------------------|---------------|-------------------------------|----|
| Absent                      | 2                          | 7             | 13                            | 22 |
| Present                     | 15                         | 26            | 6                             | 47 |
| Total                       | 17                         | 33            | 19                            | 69 |
| $\chi^2 = 16.57$ $p < .001$ |                            |               |                               |    |

The distribution of camps to Rank I streams, and the distribution of transects without sites is quite similar: the average distance is small throughout the sampled area. Additional analysis and testing concentrated on Rank II or higher streams, due to the low variation in the average distance to Rank I streams.

Transect data allow controlled tests of distribution, and site data provide exact estimates and allow more site type classes to be analyzed. The weighting of distance values induced by clusters of sites expresses the effects of more favorable settings upon the distribution, which transect data minimizes. A breakdown of the average distance to Rank II streams by site type and regional strata is in Table 35. To facilitate analysis, sites were grouped into three categories: type 2 camps, roasting pits, and other site types. Roasting pits were isolated due to their frequency, and the supposition that their location can be explained by other factors (e.g. presence of agave).

A consistent pattern appears for nearly all strata: Camps < Non-Camp Sites < Roasting Pits. Mann-Whitney U tests were conducted comparing Camps vs. Non-Camp Sites (deleting Vallecito-Mountain stratum). The difference in median distance is greatest in the McCain Valley-Mountain Valley stratum, where it is highly significant as a p-value of .0062. Combining information the pooled probability is  $\chi^2 = 19.08$ . Thus, there is significant evidence that type 2 camps are located closer to Rank II streams than other site types (excluding Vallecito-Mountain).

Examination of Table 36 shows an interesting trend: milling sites (types 09, 10, 21) were similar to type 2 camps in their distributions to Rank II stream distances. A plot of the cumulative relative frequency of sites to distance to Rank II is in Figure 11: extremely similar patterns of milling



# CORRELATION OF SITE TYPES AND DISTANCE TO STREAM

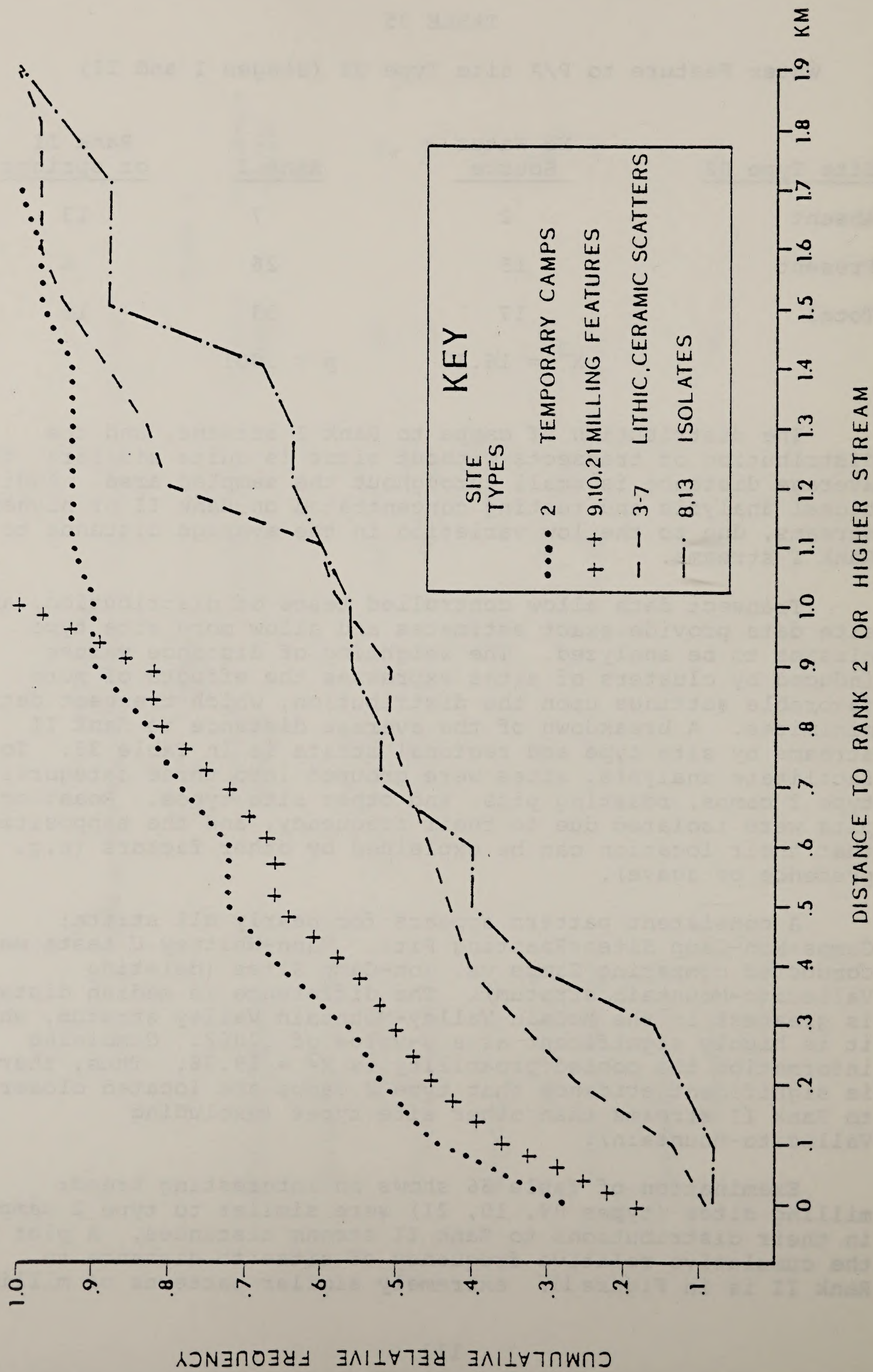


FIGURE 11



sites and temporary camps exist. Isolates and lithic sherd scatters are given for comparison.

A more generalized test was conducted: milling sites to non-milling sites. The inclusion of milling sites (types 09, 10, 21) resulted in a large difference in medians, indicating that milling features perhaps may be important in predicting site location.

A Wilcoxon Matched Pair test was conducted on transects with multiple sites. The average distance to Rank II streams for milling sites vs. non-milling sites within each given transect was compared, with results showing that milling sites are closer to streams (at  $p = .0367$ ). Thus, evidence supports the hypothesis that milling components (including temporary camps) are significantly closer to Rank II streams than non-milling sites. The distance to water feature types for all site types, by section, is in Table 36. Again, temporary camps are consistently closer than any other site type. The constraints hypothesized upon site location seem to relate to activity sets, which bear only a limited correspondence to site types, as testing of the effects of particular components has shown to discriminate milling as a component that is specifically related to camp distribution. For further analysis, site types were reclassified under a more interpretive framework to test the behavioral/functional assumptions presented earlier.

In the discussion of intra-class variability it was indicated that there is heterogeneity within type 2 camps; the present analysis shows that this is more directly associated with water as compared with other site types. The inferred relationship of water to activity sets suggests that distance to water sources is a relevant measure to test intra- and inter-class variability. To test this, several reclassification algorithms are made: the division of type 2 sites; the weighting of midden as a habitation indicator; and the relaxing of size or aggregate component criteria in separating types.

A reclassification of type 2 sites was proposed on the basis of ceramic/flaked lithic refuse densities in conjunction with bedrock and portable milling features. Comparing distances to Rank II or higher streams or springs, the mean values for the two groups are:

|              |             |          |                 |
|--------------|-------------|----------|-----------------|
| Type 2 Camps | Class IV-IV | Above BP | $\bar{X} = .05$ |
|              |             | Other    | $\bar{X} = .32$ |

(All Stages)

The distance appears large but ten of the 25 sites in "Other" are within .1 kilometers of Rank II streams or springs. As with strictly formal component criteria, some distinction is indicated, but not enough to support a division into discrete sets.



Midden formation at a site locus occurs from organic waste deposited through habitation or food processing activities, both of which are expected to be associated with water sources. In the sample, midden predominantly occurs at the aggregate type 2, but some was also noted at milling sites, scatters, and at a rockshelter. Taking the mean distance for all sites with midden, an association emerges ( $\bar{X} = .08$ ). This is interesting in that scatters and milling sites with midden are much closer than other sites within those classes. Midden is strongly associated with water sources.

The analysis leads to reclassification of site types into more interpretive, less componentially structured categories. Distinctions between small type 2 camps and the three other milling types may not be functionally important, representing only variability within vegetal processing sites as opposed to habitation. Similarly, size distinctions among lithic or ceramic scatters may not be functionally significant. The following kinds of sites were cross-tabulated with distance to water sources to evaluate the classification system: large complex type 2 camps and other sites with midden; small type 2 camps without midden and all other milling sites without midden; lithic and sherd scatters; lithic scatters; sherd scatters; isolates; and roasting pits. The results are presented in Table 36.

The differences in values between the new classes as well as the consistency of the constituent types within each class were pronounced. Though differences in distances are not functionally important (100 meters vs. 400 meters), various site types do exhibit relative differences between classes, consistent with assumptions of functional requirements for activities assumed to be represented.

Drainage morphology combined with springs appears to be an effective discriminant of site distributions. There are difficulties interpreting these results, however. Drainage morphology is not an accurate predictor of current water availability. The distance to a Rank II or higher stream does vary by site type, but the data presented includes distances to field-observed active springs, which cannot be scaled from base maps. A variable distribution of site types in relation to drainage morphology has been demonstrated; densities cannot be inferred from these data. Specific density estimates and the variance within would require further sampling within a specific strata.

Large habitation sites almost always have an association with active water sources. Other smaller sites with midden were found to be associated to hydrologic features that either are or were likely to have been active. Other sites are consistently distributed spatially in regard to drainage features by major artifact components. That Rank II streams



are important discriminants of site frequency and type variability may be related to water source availability or movement across areas along major drainage corridors. Site densities within major catchments appear higher (e.g. Bow Willow, Lost Canyon, Tule Creek-Walker Canyon) but further sampling would be required to estimate the differences. At present, a restratification drawn as a 1 kilometer strip along the center of Rank II or higher drainages and .5 kilometer radius from springs appears to be the most powerful discriminant of site type variability and density.



TABLE 36

Distance to Rank II or Higher Streams or Observed Springs (km)

Site Data: All Stages

|                                                                 |                    |      |
|-----------------------------------------------------------------|--------------------|------|
| Habitation: Midden or IV-IV BP                                  | Type 1             | .08  |
| Milling Stations: Non-Midden, Small                             | Type 2             | .45  |
|                                                                 | Type 9             | .38  |
|                                                                 | Type 10            | .40  |
|                                                                 | Type 21            | .40  |
| Sherd/Lithic or Lithic Scatters: Non-Midden, Scatters, Isolates | Types 3-4          | 1.10 |
|                                                                 | Types 5-7          | 1.00 |
|                                                                 | (Isolates) Type 8  | 1.00 |
|                                                                 |                    |      |
| Sherd Only Scatters: Non-Midden, Scatters, Isolates             | Type 12            | .64  |
|                                                                 | (Isolates) Type 13 | .52  |
|                                                                 |                    |      |
| Roasting Pits: Non-Midden                                       | Types 14-15        | .67  |



### 3.4 Discussion of Analysis and Conclusions

One of the study objectives was the formulation of a predictive model which could be used by BLM to facilitate better management of their cultural resources. According to the request-for-proposal, the Class II Inventory was to result in the "prediction of zones of greater or lesser activity by past human populations" and "projections of expected density distribution and diversity of cultural resources (RFP YA-512-RFP 9-24:pp. 26-27)." Predictions, however, may be derived from simple empirical analyses without actually having knowledge of the operation of a given system. While valid, these empirical predictions often fail to account for a considerable proportion of variance, especially in the more complex human systems. To understand the sources or causes of variance, for example in settlement patterns, some knowledge of the system, its elemental components, their interrelationships, and operations is imperative.

In this section, the observed settlement pattern is examined and analyzed non-statistically. The pattern is then explained using a generalized culture-ecologic theoretical approach. The archaeological analysis of both probabilistic and previous site samples is summarized, and pertinent enthnographic information is provided. This information is then used to construct a preliminary model, an heuristic device which attempts to generate a series of archaeological implications to explain settlement patterning in the McCain Valley study area.

#### Summary of Probabilistic Sample Analyses

From a probabilistic sample of BLM lands stratified by region and landform type, specific resource densities were derived and temporal, formal, and environmental variability assessed. Analyses controlled for the distribution of sites by sample transect, and also treated site types as aggregate sets, independent of their sample transects. The analytical sequence involved first evaluating site temporal and formal concerns, then investigating their spatial and environmental variability. This priority was necessary to insure that possible settlement pattern change would be isolated and controlled for, and that site definitions remained constant and unambiguous during later analyses. This was difficult given the paucity of diagnostic, temporally sensitive artifacts and the absence of formal-functional algorithms; it was also problematical given the limited sample size and limited usefulness of previous research. Nevertheless, spatial and environmental analyses were performed and resulted in several conclusions relevant to locational or settlement-subsistence questions. A summary of the analyses follows.



### Temporal Variability

Primarily based on a qualitative analysis of the presence or absence of ceramics, it was concluded that all sites would be assumed to be Late Prehistoric and thus be treated as grossly synchronic. While data from this inventory and previous site records indicate the presence of older sites in the sample and study area, inclusion of these in the analysis was considered implausible given their infrequency.

### Formal Variability

Formal variability was tested by component and feature aggregate distribution analysis. Component distributions were ordered into a series of logical combinations so that inter-class variability was arbitrarily defined and explicitly controlled. Inter-class variability was adequately controlled by a qualitative ordering of three components: milling, ceramics, and flaked lithics, with the additional occurrence of certain isolated features: roasting pits, rock alignments, and rockshelters. Tests of homogeneity within each of the 23 types assessed the distribution and frequency of specific artifact types and overall site morphologies. Only one type, temporary camps, appeared heterogeneous; that is, only temporary camps varied significantly within their class. However, variability was a function of cumulative site size, requiring analysis with additional variables to effect partitioning. This procedure allowed sites within each class to be treated as equivalent cases for regional and environmental analysis. It also allowed redefinition or reclassification for a variety of other analyses since the distribution of components and elements are explicit.

Though strict formal to functional site type algorithms are problematic, inferences can be made. In the initial distribution, over two-thirds of the sites had some vegetal processing features (milling, roasting pits), while approximately 15% were habitational. Agave roasting pits were the most numerous sites found in the area, and with isolates or other functionally ambiguous sites constitute 60% of the sample. Thus, most analysis lay in the remaining 40% of the 203 sites recorded, clearly a limited sample from which to work.

### Spatial/Environmental Variability

After analysis of site formal and temporal variability, a series of environmental variables were quantified and analyzed. These data, based on field observations and generalized abstractions from base maps, included variables related to regional, topographic, geologic, hydrologic, and floral distributions.



Density estimates were compiled for all sites and specific site types by region and landform (sample strata). Statistically significant variation in density occurred in only two instances: (1) the Table Mountain regional stratum contained a significantly higher density of total sites than any other region, and (2) a significantly higher density of roasting pits occurred in Vallecito-Canebrake than in either the McCain Valley or Table Mountain regions. However, the paucity of significant differential densities is probably a function of sample size and consequently lessens the power of a given statistical test to discern significant differences. It is probable that regional and landform differences in total site density and specific site type densities do, in fact, vary significantly. For example, a larger sample would undoubtedly have found differences between temporary camp densities in Table Mountain and McCain Valley mountain strata, calculated at 6.86 and 1.14 temporary camps per square mile, respectively.

Beyond analysis of differential site density by region and landform, several other environmental variables were examined. Those in physiography included: geologic formations, slope, and local relief. While none of these were particularly sensitive site location discriminants, with certain qualifications they could be useful, especially considering the heterogeneous nature of the study area. An exception is the redundancy of regional geologic formations. The primacy of a few formations inhibited detection of locational differences; only the occurrence of metavolcanics within the Table Mountain region could possibly be ascribed any contributory function.

Difficulties encountered attempting to operationalize slope and landform variation resulted in other interpretive problems. Slope did, in part, affect site frequency, but no strong inverse relationship was apparent, and sites frequently occurred on slopes with up to 50% gradient. Landform evaluations, ranging from the sample stratification type to applications discussed in SARG (1976), were also ineffective. This is probably due to the heterogeneous character of the sample area in addition to operational ambiguities. Thus, while some regional landform patterning was apparent, e.g. complex sites in desert valleys are situated closer to major landform interfaces than those in mountain valleys, additional variables are required to control for spatial variability in site distribution.

Analysis of associations between sites and both plant communities and specific genera produced interesting results. Among the generalized plant communities, statistical tests show: (1) a significant negative association between sites and mountain chaparral, and (2) a strong positive association for sites and upland desert scrub. The evaluation of associations between sites and specific genera or species, though showing some promise for future research, was hampered by the quality of detailed information on spatial distributions



of key economic species.

Hydrologic features were ranked under the Strahler method and the minimum distances from sites to various water-related features were then measured. Significant variation in site type and density was noted as a function of the distance to Rank II or higher drainages, or springs. Large sites with all primary components and all other sites with midden were within 100 meters of such features. Smaller sites with milling and without midden averaged about 400 meters, while all lithic, or ceramic/lithic scatters averaged about one kilometer. The consistency of distance averages between classes and within each group is noteworthy and some more interpretive classification of scatters, small milling sites, and camps and villages may be possible.

As a final test for locational factors, a discriminant analysis (SPSS version) was performed on the combined environmental variables to test their individual contributions to variability in the overall regional site distributions. Although numerous tests were run on different combinations and weightings, as anticipated, hydrology was the most significant factor controlling overall distribution. Hydrology thus appears to have the greatest power in a predictive model. But, though the other variables were not particularly sensitive, they may affect site location. This could well be the case given operational difficulties, the highly heterogeneous character of the sample area, and its non-contiguous, patch-work-type areal distribution. Therefore, both qualitative and quantitative statements about the settlement patterns for the McCain Valley Study Area should be considered.

#### Summary of Previous Site Record

A comparison of previous site record (PSR) data with those derived from this Class II inventory indicates that the former are of only marginal utility in constructing locational or settlement-subsistence models. Much of this is due to the incompatible nature of the various samples, i.e. probabilistic versus systematic, judgmental, or fortuitous, and to the multiplicity of site recordation procedures. However, the PSR: (a) provides data indicating that a greater temporal range of sites exists; (b) contains an inventory of rarely occurring, unique site types which probabilistic samples generally fail to encounter; and (c) provides data for large acreage surveys which can complement small probabilistic surveys.

With regard to temporal variability, the probabilistic sample was assumed to be predominantly Late Prehistoric. The PSR contains numerous cases of Paleo-Indian sites, however, which either did not show up in the probabilistic sample or were unidentifiable as such. These sites, attributed to the



the San Dieguito, are reported in the southern part of the study area, mainly around Carrizo Wash and Table Mountain-Jacumba. Sites postdating the Paleo-Indian Horizon but predating Late Prehistoric occupation are, though, not present in the previous site record. Wiede (1974) and Kowta (1969) have suggested that this was a consequence of climatic change, in that the Early Millingstone groups had to abandon much of the desert area due to depletion of basic subsistence resources during the hypothetical antithermal period.

The occurrence of San Dieguito sites in the PSR exemplifies what is meant in (b) above; that is, they are infrequent and thus are not expected to show up in a seven percent probabilistic inventory. Other site types, such as rock art and trails, would likewise possibly be under-represented had not interested researchers studied the region with these particular orientations in mind. Therefore, while such rare sites are of minimal consequence in general economic-oriented model building, their occurrence is significant, both as resources in and of themselves and as integral components of archaeological cultural systems.

Table 37 contains a breakdown of site type by location for the PSR; only those in parentheses are within BLM lands. Of twenty possible site types defined and used in this report, only ten types were used by previous researchers. Within the sample universe, only 167 sites had been previously recorded, a rather small number considering that this Class II recorded 254. Comparing the type distribution for the PSR and ASM samples for three regions (Table 38), several differences are readily apparent.

First, larger, more complex sites are over-represented in the PSR. This is not surprising given their size and interest to various independent investigators. Whether this is actually a function of study emphasis, i.e. concentration on large, "significant" sites, or site recordation and classification procedures, is difficult to ascertain. Both may be partly responsible. However, 56.8% of the ASM sites were roasting pits, essentially isolated features. If these features are eliminated and percentages recalculated, temporary camps increase in proportion to 20% and 30% for the ASM and PSR samples, respectively. While there is still some disparity between the figures, specific causes remain problematical.

Second, even considering that the previously recorded sites were reclassified according to the ASM typology, numerous types are totally missing from the PSR though are found relatively frequently in the probabilistic inventory. In addition, the lack of correspondence between site types for the three major regions makes the PSR rather suspect. That no large sherd scatters have been recorded other than through the Class II study, and that so many groundstone-ceramics (only)



TABLE 37

Breakdown of Site Type by Location  
for the Previous Site Record

| LOCATION        | 2          | 3        | 4        | 5          | 6        | 7        | 9          | 10         | 14         | 21       | TOTAL       |
|-----------------|------------|----------|----------|------------|----------|----------|------------|------------|------------|----------|-------------|
| Vallecito       | 1          | 0        | 0        | 0          | 0        | 0        | 2          | 4          | 19<br>(*)  | 2        | 28          |
| Canebrake       | 24<br>(21) | 1<br>(1) | 0        | 0          | 0        | 0        | 25<br>(22) | 25<br>(24) | 25<br>(18) | 6<br>(5) | 106<br>(91) |
| Mason           | 1<br>(1)   | 0        | 0        | 0          | 0        | 0        | 0          | 5<br>(1)   |            | 0        | 6<br>(2)    |
| Carrizo-Sweeney | 3<br>(0)   | 1        | 0        | 1          | 0        | 0        | 2          | 0          |            | 4<br>(1) | 11<br>(1)   |
| San Felipe      | 5          | 1        | 0        | 0          | 0        | 1        | 3          | 7          | 3          | 0        | 20          |
| Montezuma       | 2          | 0        | 0        | 0          | 0        | 0        | 4          | 10         |            | 1        | 16          |
| Indian          | 9          | 0        | 2        | 0          | 0        | 0        | 0          | 0          |            | 4        | 15          |
| Jewel           | 4          | 0        | 0        | 0          | 0        | 0        | 0          | 0          |            | 1        | 5           |
| Palm            | 0          | 0        | 2        | 0          | 2        | 4        | 0          | 0          |            | 0        | 8           |
| McCain          | 27<br>(12) | 4<br>(1) | 5        | 1<br>(1)   | 2        | 4        | 4<br>(2)   | 7<br>(1)   |            | 5<br>(4) | 69<br>(21)  |
| Jacumba         | 1          | 3        | 5        | 2          | 4        | 3        | 0          | 1          | 6          | 1        | 26          |
| Table           | 16<br>(14) | 4<br>(4) | 2<br>(2) | 21<br>(18) | 8<br>(7) | 1<br>(1) | 0          | 0          |            | 5<br>(5) | 57<br>(51)  |
| Walker          | 0          | 0        | 0        | 0          | 0        | 0        | 1          | 0          |            | 0        | 1           |
| Rockhouse       | 0          | 0        | 1<br>(1) | 0          | 0        | 0        | 0          | 0          |            | 0        | 1<br>(1)    |
| Julian          | 0          | 0        | 0        | 0          | 0        | 0        | 0          | 3          |            | 0        | 3           |
| TOTAL           | 113        | 14       | 17       | 25         | 16       | 13       | 40         | 62         | 54         | 29       | 383         |

( ) parentheses indicate number of sites within BLM lands



TABLE 38

Comparison of Class II (ASM) and Previous Site Record (PSR)  
Results by Three Study Sections

|                         |    | TM   |      | Mc   |      | V-C  |      | Total |      |
|-------------------------|----|------|------|------|------|------|------|-------|------|
|                         |    | ASM  | PSR  | ASM  | PSR  | ASM  | PSR  | ASM   | PSR  |
| temp. camp              | 2  | 16.7 | 27.5 | 11.6 | 57.1 | 7.3  | 23.0 | 9.5   | 28.8 |
| large L/C               | 3  | 8.3  | 7.8  | 2.4  | 4.8  |      | 1.1  | 1.5   | 3.7  |
| small L/C               | 4  | 8.3  | 3.9  | 1.9  |      | 0.8  |      | 1.9   | 1.2  |
| large-light L           | 5  | 8.3  | 35.3 |      | 4.8  |      |      | 0.8   | 11.7 |
| small-dense L           | 6  | 2.8  | 13.7 | 0.9  |      |      |      | 0.6   | 4.3  |
| small-light L           | 7  | 5.6  | 2.0  | 7.4  |      |      |      | 2.7   | 0.6  |
| isolated L              | 8  | 8.3  |      | 10.9 |      |      |      | 4.0   |      |
| G/C                     | 9  |      |      |      | 9.5  | 3.2  | 24.2 | 1.9   | 14.7 |
| G only                  | 10 | 5.6  |      | 2.7  | 4.8  | 2.8  | 26.4 | 3.1   | 15.3 |
| rub only                | 11 |      |      |      |      | 1.5  |      | 1.0   |      |
| C only 10               | 12 |      |      | *    |      | *    |      | 1.7   |      |
| isolated C              | 13 |      |      | 10.2 |      | 9.2  |      | 6.9   |      |
| ARP w/o                 | 14 | 33.3 |      | 47.2 |      | 64.4 | 19.8 | 56.8  | 11.1 |
| ARP w/                  | 15 |      |      | 0.5  |      | 3.6  |      | 2.3   |      |
| rockshelter<br>w/ L/G/L | 16 |      |      | 2.4  |      |      |      | 0.7   |      |
| rockshelter<br>of cer.  | 18 |      |      |      |      | 4.8  |      | 2.3   |      |
| picto                   | 19 | 2.8  |      |      |      |      |      | 0.3   |      |
| rockwall                | 20 |      |      |      |      | 2.4  |      | 1.0   |      |
| G/L                     | 21 |      | 9.8  |      | 19.0 |      | 5.5  | 0.5   | 8.6  |
| cupules                 | 22 |      |      | 1.9  |      |      |      | 0.5   |      |
| TOTAL                   |    | 100. | 100. | 100. | 100. | 100. | 100. | 100.  | 100. |

- Notes: a) ASM based on total estimated number of sites  
(Density Estimates)  
b) PSR based on Table 3.3-9; only those in ( )s used  
c) \* = present, but not calculated



sites were found previously while only a small number were recorded from this study undermines confidence in the PSR.

The highly problematic nature of these discrepancies is also exemplified by the near-total absence of groundstone-lithic sites (type 21) in the ASM sample compared to that of the PSR. It is difficult to imagine that either many exist but went unsurveyed due to sampling error or that they were not identified nor classified as such. Since this site type could represent a preceramic Late Prehistoric or Early Millingstone component, it is unfortunate that this (and other) discrepancies cannot be adequately resolved without additional fieldwork.

There are, nevertheless, certain instances where previous site data can be used, depending on record detail. These are the large acreage surveys within or adjacent to BLM lands. The primary examples include: (1) Ron May's Table Mountain survey with SDCAS personnel, (2) Hedges' and Morin's survey of Canebrake, and (3) Melissa Johnson's SDSU survey of the west-central portion of McCain Valley. All three resulted in well-documented records of large land tracts, and will be incorporated as needed in the following text. Otherwise it is assumed that, within reasonable confidence limits (statistical and non-statistical), the ASM sample is representative, and more accurately reflects the actual archaeological record.

#### Ethnographic Considerations of Settlement-Subsistence Factors

Having analyzed and discussed the archaeological record, the only other major source of information potentially useful for settlement-subsistence modeling is the ethnographic record. In the following pages, Ken Hedges has summarized ethnographic data relevant to socio-economic aspects of the Late Prehistoric hunter-gatherers of the area. The archaeological implications, considered briefly, are developed at length afterward and examined for "goodness of fit" with the observed archaeological manifestations.

Although the characterization of southern California Indian culture based on a hunting and gathering economy with seasonal round patterns of resource exploitation is generally accepted and has been competently summarized (Wirth Associates, 1978), it is difficult to extract sufficient detail from the ethnographic accounts to enable reconstruction of aboriginal land use and settlement patterns for the various subdivisions of the McCain Valley Study Area. It is apparent that land use patterns vary, sometimes drastically, because of variables such as geomorphology, resource base, and availability of water. The examination of the ethnographic record, without specific reference to the results of archaeological studies in



the area, is designed to provide comparative data for interpretation of land use and settlement patterns. Specifically, the ethnographic record is examined with respect to (1) ethnographic accounts of land use and settlement patterns as sources of models for interpretation of the archaeological record; (2) identification of specific plant resources which appear to play major roles in determining land use and occupation patterns; and (3) concepts of land and resource ownership which will affect the nature of land use and the composition of groups using the land.

In general, the study area was occupied by groups, primarily Kumeyaay, who were grouped into localized lineages or clans with patrilineal descent and patrilocal residence (Kroeber, 1925:719). Each clan had a generally recognized claim to a specific territory, although these territories overlapped and it was possible for two or more clans to occupy a single village (Luomala, 1978:597).

The bands followed seasonal subsistence rounds which made use of food resources at varying altitudes, those at progressively higher elevations ripening in turn as the season progressed (Luomala, 1978:599). Although this general pattern is well documented, specific patterns of resource utilization and their relationships to localized environments are, for the most part, unrecorded. It is the purpose of this section to summarize those data for the Kumeyaay and their close neighbors which may assist in the interpretation of archaeological site distribution.

#### Land Use and Settlement Patterns

Ethnographic sources including Kroeber (1925), Luomala (1978), Lee (1937), and Cuero (1968) provide data on the general pattern of land use summarized above, but do not provide specific examples relating to identified geographical areas. Areas for which some specific data are available are summarized in the following paragraphs:

Cahuilla: Bean (1972:70-75) and Bean and Saubel (1972:19-21) report that each Cahuilla sib occupied a territory with one centrally located village which served as a permanent base of operations. Villages were usually situated in the richer food-gathering area of the territory, and were never farther than 16 miles from the major food resources. As a result, forays away from the village were generally of short duration, and the village served as a true sedentary base of operation.

Luiseno: Luiseno territory was divided into rancherías or village territories, each with a vertical physical arrangement encompassing a variety of local environments from sheltered river valley bottom to high elevation oak groves (White, 1963:120-121). Each village was clan tribelet, with patrilineal descent and patrilocal residence (Shipek, 1977:27-28; Bean and



Shipek, 1978:555-556). The village pattern itself was bipolar, or comprised of two primary seasonally occupied settlements, with a major sedentary village located in the river valley, usually in the warmer thermal bands just above the valley floor, and secondary autumn village occupied by the entire group at the time of acorn harvest; this bipolar pattern is well documented, both ethnographically and by the archaeological record (White, 1963:120; Meighan, True and Crew, 1974:76-80). Resources in each territory ranged from live oak forests and riparian vegetation in the river valley through varied mountain slope resources to the high elevation black oak groves.

Northern Diegueno (Ipai): Gifford (1918:172-174) reports that the people of Mesa Grande formerly wintered at the village of Pamo. Pamo, at an elevation of 900 feet, is located in the live oak zone, while Mesa Grande, at 3300 feet, is a region characterized by the favored black oak. The land use pattern is thus seen to be similar to the bipolar pattern of the Luiseno. Clan or lineage territories are not as distinct, however, and an absence of localization is indicated by the fact that several clans wintered together in the village of Pamo. Similar situations probably existed elsewhere in Northern Diegueno territory, with the lower valley environment of Santa Ysabel contrasting with the high elevation resources of Volcan Mountain, as one example.

Kumeyaay: The notes of Judge Benjamin Hayes indicate a similar pattern for Kumeyaay who wintered in their main village at Guatay, and moved into the high elevation valleys of Cuyamaca for the fall acorn harvest. Here again, two specific contrasting village locations are noted, although it is implied that a single major sedentary village existed at Guatay -- the permanent village -- with the people breaking up into smaller groups for seasonal exploitation of the high elevation resources (Hayes, 1934). In this case as well, the contrasting environments are live oak woodland at lower elevations and mixed pine-black oak forests at the higher elevations. In this, the Northern Diegueno, and the Luiseno cases, the contrast is between areas characterized by similar resources -- both are oaks, although the high elevation black oak is favored for food.

Kumeyaay: The reminiscences of Tom Lucas (Cline, 1979: 13-20) provide specific data on seasonal land use and settlement patterns. Once again, the pattern is similar to the bipolar Luiseno scheme, but with a major contrast between highland black oak resources on the one hand, and desert valley resources such as agave and mesquite on the other. Permanent villages in the Laguna Mountains are contrasted with winter villages in Mason Valley, while the mountain village at Cuyapaipa contrasts with major winter settlements in Canebrake Wash. Similar connections can be postulated between the Julian



area and desert valleys such as Sentenac or Earthquake Valleys, although these are not specifically documented. The paired localities are well documented, both ethnographically and in the presence of large archaeological sites in the specified areas. The ethnographic record in this case is directly applicable to the present study, since the areas in question lie within the study area.

Kumeyaay: Drucker (1939:5) provides a succinct summary of settlement patterns for an informant from Manzanita, in the southern part of San Diego County:

The winter home of the family was in the foothills east of Campo, at a place called Wipuk. They were typically Diegueno in culture and language. In the spring, they moved westward into the mountains, where they usually spent the summer. In fall, they moved down to Picacho, in Mexico for pinyon nuts, and then back to their winter home in the foothills. Sometimes several families would go to Yuma in the fall, after the harvests, where they were fed by the hospitable Yumas. Once in a while they would stay all winter. In years in which there was a big overflow in the Imperial Valley, they might be given some seed by the Yumas, and farm a little.

This account is valuable for several reasons. It is noteworthy that this account does not exhibit the distinct bipolar orientation in the land use pattern. This is in keeping with the geographical situation, since the clear correlations between desert valleys and mountain locales with direct trail connections are not present in the southern part of the county, which is characterized by rolling hills where the mountains flatten out as they approach the international border. This account also illustrates the occasional role of agriculture in native subsistence, the variability inherent in the land use patterns, and the seasonal trip to pinyon groves in Mexico.

Kumeyaay: The data provided for the Kumeyaay by Gifford (1918:167-169) and by Spier (1923:297-308), both of whom used the same informant, is in many ways the most complete, yet frequently the most frustrating information on Kumeyaay settlement patterns. The definite statements that clans are patrilineal, patrilocal, and localized with specific territories sets the basic pattern, but the details are not at all clear. There is a certain amount of confusion in Spier's account due to the facts that his map cannot be made to correspond to modern maps of the area, many of his place names do not have identifiable modern counterparts which might facilitate their location, and the recorded territories appear to overlap. This, of course, reflects the information provided by his informant, and it is apparent that the verbal



information could not be field-checked when it was gathered. The resulting inability to superimpose the recorded ethnography onto the real geography makes use of the data for interpretive purposes extremely difficult. It is probable that the data also reflects the disruption of native culture which had occurred in the century and a half preceding Spier's fieldwork, so that the informant's recounting of every place where a member of a certain clan once lived probably does not reflect actual clan territories. In any case, it is apparent that clan territories encompassed a variety of environmental zones, and that clan territories overlapped, at least in historic times. Spier does provide the following general statement of subsistence patterns:

The occupancy of the gentile territories was seasonal. Winter found them living in groups of mixed gentile affiliation on the edge of the Colorado Desert. In the spring they returned to the mountains, keeping pace with the ripening of the wild food staples, and passing the summer in their respective territories, where they lived in little groups about the valleys. The whole territory was not occupied at one time; when a locality was hunted out or fruits ripened elsewhere, they moved on. In the course of a year or so, however, all of the recognized settlements would have been occupied (Spier, 1923:306).

It can be seen that no clear picture of a scheme involving a major sedentary village exists, but the "groups of mixed gentile affiliation" in the winter settlements may again be a reflection of amalgamations of people brought about by cultural disruption in historic times. In general, the pattern is similar to that presented in Drucker's data from Manzanita.

The apparent pattern in Kumeyaay territory, as one moves from north to south, is a gradual shift from a distinct bipolar land use pattern to a more diffused pattern in the regions where distinct contrasting geographical situations do not exist. In the latter case, the pattern appears to resemble the Cahuilla scheme, with a central village in a clan or lineage area, which served as the permanent base for resource exploitation in the territory.

#### Plant Resources as Determinants of Land Use

Since the exploitation of plant resources is generally agreed to be the primary activity associated with occupational sites, a detailed examination of these resources as determinants of site location is appropriate. Unfortunately, the ethnographic data do not always lend themselves to this type of analysis, but sufficient information exists for a few major categories of flora to provide a starting point for discussion.



It is important to distinguish between plants which are usable resources and those which are determining resources. Many plants, both medicinal and edible, were certainly used without being either abundant enough or significant enough to justify the location of an occupation site in a particular place. Major plant resources, however, can be and certainly must have been determining factors in the location of villages and camps.

The relative importance of various types of plant resources has not been quantified in the literature. Thus, while we know that plants such as cacti, yuccas, grasses, and sages were considered important resources (Luomala, 1978:600), there is no sure way to determine the degree of importance which they held in native economy. In these cases, we are likely eliminating important resources for lack of data, rather than giving any undue importance to a resource which was really not that significant in native economy. Other resources, such as the sumacs, chollas, catclaw, and juniper, are likewise known to have aboriginal food value, but the evidence suggests that they were not of major importance, often serving as famine foods. Like medicinal plants which were widely distributed, easily dried and stored, and needed only in small quantities, the plant foods of lesser importance were not likely determining factors in the location of aboriginal sites. This leaves us with the consideration of the recognized major categories of food resources: the oaks, mesquite, agave, prunus, and pinyon. With the exception of pinyon, all are found in significant concentrations within the study area.

Quercus: The importance of the various oaks is well documented for California cultures in general and for the Kumeyaay in particular (Kroeber, 1925:722; Spier, 1923; Lee, 1937:63-101; Cuero, 1968:27; Cline, 1979:29-30; Luomala, 1978:600; Hedges, 1967:4-8). Oaks fall into three categories: the black oak (Quercus kelloggii) grows at higher elevations along the western edge of the study area in the Laguna, Cuyamaca, and Volcan Mountains; coast live oak (Quercus agrifolia) grows at nearly all elevations, from the coast through the foothills to the higher mountains and over onto the eastern slopes, stopping at the desert transitional zones which begin in areas such as McCain Valley, Bankhead Springs, and Jacumba; and scrub oaks (Quercus dumosa and a few stands of Quercus palmeri near Jacumba) grow throughout the desert transitional and chaparral zones. While generally considered a secondary resource, scrub oaks figure importantly for subsistence in areas where other oaks were not available; their importance is attested to in references in the literature (Spier, 1923:307; Lee, 1937:94) and by the discovery of a pottery olla filled with scrub oak acorns, found near Picacho in Baja California (Museum of Man collection). The groves of black oak were the destinations of the autumn acorn-gathering expeditions in all of the land use patterns described above; they formed the high elevation components of all the bipolar systems, while the more



generalized subsistence strategies (such as at Manzanita) included expeditions to mountain areas for black oak. Live oak, on the other hand, was present at the major village loci of those systems encompassing mountain and western foothill habitats, and did not require expeditions for acorn gathering. In the study area, scrub oak is the most important Quercus resource, and is a potential determining factor in site location.

Prosopis: The importance of the mesquites (Prosopis glandulosa or honey mesquite, and Prosopis pubescens or screwbean) is best documented for the Cahuilla (Bean and Saubel, 1972:107-119). Mesquite does not figure prominently in the literature on the Kumeyaay, although Tom Lucas (Cline, 1979:30) reports that "the mesquite bean is a favorite food found in desert areas." The lack of mention in the standard ethnographies is best taken as a gap in the data which cannot be taken as an indication of the relative importance of mesquite in the native economy. The importance of mesquite in all other cultures with similar habitats, the few references in the literature, and the presence of major village sites in association with mesquite groves should demonstrate the importance of this resource. Mesquite grows in well-watered locations in the study area, including Jacumba Valley, Bow Willow Canyon, the head of Canebrake Canyon, Agua Caliente, Vallecito, Mason Valley, and Sentenac Cienaga, among others. Subjectively speaking, there appears to be a strong correlation between mesquite groves and major village sites. Mesquite is certainly a determining factor in site location. Finally, it should be pointed out that Luomala (1978:600) alludes to the importance of mesquite with her statement that acorns were the staple food of all Kumeyaay except those of the Imperial Valley, for whom the staple food was mesquite. This statement fails to recognize, on the one hand, the importance of mesquite in desert areas outside the Imperial Valley, and, on the other hand, the importance of agave as a major desert staple (cf. Kroeber, 1925:722).

Agave: The desert century plant, also known as mescal or maguey (Agave deserti), is extremely abundant in the desert mountain, ridge, and valley areas of the study area. As Kroeber (1925:722) notes, the agave loomed as a staple food in desert areas of Kumeyaay territory. Agave was prepared in the spring, at which time the hearts of the plants were pit roasted (Lee, 1937:12-20; Chase, 1919:62-63). The time for agave harvest signaled the migration of large numbers of people to the desert areas, and it is quite likely that the numerous Indians reported by Fages in the Mason Valley area in April, 1782, were there for this resource (Priestly, 1913:95). Distinctive roasting pit features resulted from agave preparation, as described by Chase (1919:62-63):



...a pit was dug, two or three feet deep and somewhat more in diameter. This was lined, bottom and sides, with flat slabs of rock and a loose coping was laid also about the edge. On this coping the agave butts were laid. A good bonfire was built over the pit, and allowed to burn for twenty minutes or so, the embers falling into the pit and covering the bottom thickly. Then the butts, already charred by the fire, were tumbled into the pit, and with them the heated coping stones and all the still-glowing embers. Earth was banked up over all, and the pit was left for the day.

The presence of agave is thus directly responsible for the location of a certain class of sites, the roasting pits, which occur wherever agave grows, regardless of terrain. It should be noted in this regard that, even though the transect sample indicates that there are fewer roasting pits in the desert valleys than had been expected, and that agave appeared less abundant on the desert valley flats than in the mountain stratum, this conclusion is apparently an accident of sampling. In the study area in general, the highest densities of agave plants occur in desert valley flats, in Canebrake Canyon/ North Wash, Vallecito Wash from Canebrake to Agua Caliente, Vallecito Valley, and Mason Valley. Field examinations of these areas indicate a high density of roasting pit features in association with these extensive agave plantations; in this case, neither the high density of agave itself, nor the associated roasting pits, showed up in the sample transects. With regard to agave as a determining factor in site location, there is a direct association between the occurrences of agave and roasting pits. Logic would suggest that the presence of agave would be a major factor in the location of large population groups in the desert habitat, but major occupation sites would not necessarily have to be in close association with the agave itself. In such instances, other factors such as favorable living areas and a dependable water supply may dictate the location of springtime villages from which smaller groups issued forth for the harvesting or roasting of agave in the agave fields.

Prunus: The genus Prunus is represented in the study area by two major plants, Desert Apricot (Prunus fremontii) and Holly Leaf Cherry (Prunus ilicifolia). References to desert apricot are absent in the literature on the Kumeyaay, while the only apparent reference to holly leaf cherry is in the references to plum bushes in Spier (1923:307, for example). As Bean and Saubel point out (1972:119-121), holly leaf cherry was the most favored of the stone fruits because of its sweet, fleshy cherry, a rarity among wild fruits in southern California. The flesh of desert apricot also is edible, but is thin and unsatisfying. The large seeds of all varieties of Prunus were ground and leached to make mush. Luomala (1978:600)



makes reference to "two species of plum and three of cherry" for the Kumeyaay in general; in the absence of species identification, it may be suggested that in this instance the "plum" reference is to desert apricot and desert peach (Prunus andersonii) while the cherries referred to are holly leaf and two mountain species, Prunus virginiana and Prunus emarginata. The use of nonspecific common names is unfortunate for identification purposes, but in any case desert apricot and holly leaf cherry are major and abundant resources in the study area, and potentially significant factors in site location. This significance is not, however, documentable from ethnographic sources on the Kumeyaay.

Pinyon: Pinyon (Pinus monophylla, Pinus quadrifolia) was an important and much-favored resource. The harvesting of pinyon is mentioned in several of the ethnographic sources on the Kumeyaay and their neighbors (Spier, 1923; Drucker, 1939:5; Cuero, 1968:28; Lee, 1937:158-206; Luomala, 1978:601; Kelly, 1977:40-41). In all cases it is specified that long journeys to Picacho or Rumorosa in Baja California were made for the pinyon harvest. It is specifically recorded that the pinyon groves were open territory where the resource could be gathered on a first-come, first-served basis. There are reports (Pryde, 1974:21) that prior to forest fires in 1945, pinyon grew in the study area, from Laguna Mountain southeastward to Jacumba. If pinyon were available in a group's local territory, it undoubtedly would have been used. However, if pinyon were a major resource in the study area, it would almost certainly have been mentioned by informants who, to the contrary, consistently specify Baja California groves as the source of this important resource. From this, it may be concluded that pinyon was not a significant resource in the study area, and that this plant was not sufficiently abundant to be a determining factor in group migration or settlement location.

### Concepts of Resource Ownership

Resources in the five major categories presented here were subject to various types of ownership. In several cases, Cahuilla practice parallels that of the Kumeyaay, so that inferences drawn from the former may be cautiously applied to the study area. The data on ownership of resources are scant, and are briefly summarized below.

Kumeyaay property concepts recognized the band's claim to territory within specified boundaries (Luomala, 1978:597), but ownership of specific resources appears to have been variable. The statement that "clans gathered unevenly distributed food and materials like agave, regardless of which owned the land" (Luomala, 1978:599) would seem to imply that major dependable resources such as oak and mesquite would be subject to controlled ownership. This conclusion is contradicted by Spier's statement (1923:307) that "there was no ownership of



groves of bearing oaks in the mountains." Tom Lucas (Cline, 1979:29) reports that at least four separate groups shared a gathering area at the base of Sheepshead Mountain in the Lagunas. It appears then that the black oak resources were relatively accessible to all, or at least to several bands at a given locale. For the Cahuilla, it is stated that lineages owned oak groves, and that families owned individual trees (Bean and Saubel, 1972:124). This does not appear to hold for the Kumeyaay with regard to black oak; however, Spier (1923:307) does state that one clan owned patches of scrub oak and coast live oak. In this instance, it appears then that there is a difference in ownership patterns depending on whether or not the resource is close at hand or obtained on a gathering expedition.

For the Kumeyaay, there are no data on ownership of mesquite resources. Among the Cahuilla, lineages owned designated groves or portions of large groves, while individual trees were owned by families (Bean and Saubel, 1972:115-116).

For the Kumeyaay it appears that there was no ownership of agave resources, as noted above (Luomala, 1978:599). This contrasts with Cahuilla practice, among whom agave areas were owned by sibs and lineages, although this ownership was not as clearly defined as with oak or mesquite, and individual plants were not owned (probably because the flowering plant is destroyed in harvesting, although this would not preclude ownership of clusters of plants) (Bean and Saubel, 1972:32).

There are few data on ownership of Prunus resources, but Spier (1923:307) reports that patches of wild plum trees (probably holly leaf cherry) were owned by one clan.

For pinyon, the record is very clear. Bean and Saubel report (1972:103) that the Cahuilla considered pinyon groves to be open to all, without specific ownership, probably because of the undependable nature of the crop. The same ownership pattern holds true for the Kumeyaay. The ethnographic accounts invariably state that various groups, both Kumeyaay and neighboring Yuman groups including Cocopa and Quechan, came from all over the southern California region to gather pinyon in northern Baja California. This alone could imply that the groves were not subject to individual ownership. Because it is confined to a specific geographical area and is somewhat undependable, pinyon would also fall within the category of "unevenly distributed food" which was not subject to ownership rules (Luomala, 1978:599). Reporting on Cocopa visits to the pinyon groves, Kelly (1977:40) notes that Cocopa and Kumeyaay camped together and shared use of the groves, and that "no tribe or group was considered to be the owner of the groves, and anyone was free to take part in the gathering."

In general, concepts of resource ownership seem somewhat related to the nature of the resource and its proximity to



permanent or semi-permanent habitation. Dependable resources located near the major settlements -- such as live oak in the western and southern foothills, scrub oak in the eastern foothills, and mesquite in the well-watered desert places -- appear to have been specifically owned by the local lineage (clan). Less dependable resources and those which were at some distance, exploited by means of seasonal gathering expeditions, seem not to have been specifically owned.

### Discussion

The ethnographic data summarized above allow for cautious subjective interpretation of archaeological site patterns in the study area. Beginning with the northern end of the study area, Spier assigns the San Felipe Valley to a single clan (1923:300); this valley connects the oak groves of San Felipe with the Sentenac cienaga area, although the cienaga might logically have been used by groups from Volcan Mountain and Julian as well. The cienaga and Earthquake Valley would qualify as a place where "groups of mixed gentile affiliation" (Spier, 1923:306) might spend the winter.

The desert valleys at Mason Valley, Vallecito, and Canebrake qualify as portions of distinct bipolar settlement patterns, connected by trails through canyons to living areas in the adjacent Laguna Mountains. This pattern is documented in the ethnographic literature, and archaeological site patterns in these desert valleys are not inconsistent with this interpretation. It should be noted that the ethnographies do not document the networks of lesser sites which might be associated with such bipolar village patterns. Archaeological survey clearly shows that numerous large and small temporary camps and resource extraction and processing sites occur in the desert valleys. The implication that permanent villages served as bases of operations for a wide variety of subsistence activities is supported by the archaeological record.

In the southern portion of the study area, the patterns are not so clear. On the one hand, large, discrete village sites are present, usually in association with permanent sources of water (Wikwip of C-154, Hakum at Jacumba Springs, the site at Arsenic Spring are examples), while other areas such as the southern flank of Table Mountain, exhibit large, heavily occupied site areas which have been called villages, but which do not appear to be associated with major water supplies, and which are more diffuse than other village sites. A similar situation, incidentally, exists in the pinyon groves at La Rumorosa in Baja California, where large, ill-defined "village" sites occur in the groves, again without a permanent water supply. These are subjective impressions, but they are consistent with other observations derived from the ethnography. Such areas as these in the McCain Valley and Jacumba regions would fit a pattern noted by Drucker for the Manzanita area just to the west, and similar to the general pattern



presented by Spier. If the Indians departed from this country (which can be bitterly cold in the winter) to sites of mixed clan affiliation in the winter, a number of low elevation localities such as Bow Willow Canyon, Carrizo Canyon, Dos Cabezas, Mountain Springs, Coyote Wells, Meyer Valley, and Davies Valley have direct trail connections with the McCain and Jacumba areas. As an exception to this general statement, it is here suggested that the hot springs at Jacumba would provide a favorable place for year-round occupation and for congregation of various clans during the cold season.

In terms of major plant associations, patterns again are present. First of all, the study area does not include black oak groves, so that this aspect of the land use pattern was not specifically investigated. It should be noted, however, that the mountain village location for the Kumeyaay was not necessarily the black oak gathering area, since Tom Lucas (Cline, 1979:29) cites a gathering area removed from the village location. Black oak thus falls into the category of plant resource obtained on gathering expeditions, even for the distinct bipolar land use pattern.

From the above summary of major plant resources, live oak, scrub oak, and mesquite might be expected to appear at permanent village locations. Again, live oak is poorly represented in the study area, but mesquite occurs in discrete localities, usually with permanent water, and villages tend to be located in similar habitats. The association of scrub oak and prunus with village locations is not as clear, since these plants are widely distributed, and thus would be expected to occur away from village sites.

Agave and pinyon, in their respective habitats, are widely distributed. While they may have been a major factor in locating village sites within a particular region, there is no clear indication that these resources played a specific role in site location. In the case of agave, it might be useful to correct a statement in Luomala (1978:601) that Mexican Tipai (Kumeyaay) had more agave than the American. While agave is readily and at times extensively available on the desert slopes of the Sierra Juarez and on the fringes of the pinyon groves, the greatest concentrations of agave by far in Kumeyaay territory are found on the American side of the border in such well-known places as Earthquake Valley, Mason Valley, Vallecito, the Vallecito Creek drainage, Canebrake and North Wash, the plateau extending eastward from Sweeney Pass, and the high country of Mountain Springs, Table Mountain, and Jacumba. In fact, there are ethnographic data (reflected, incidentally, in the boundaries shown on Luomala's map) which suggest that the Sierra Juarez foothills and canyons, and perhaps even much of the pinyon groves, were so extensively shared with Cocopa that they might not properly be included in Kumeyaay "territory."



Concepts of plant resource ownership also show some correlation with settlement and land use patterns, as might be expected. As noted above, the owned resource, notably mesquite in the study area, tend to appear at major village locations. More diffuse resources generally considered available to all tend to correlate with more diffuse settlement patterns and ill-defined major "villages." The problem of specifically owned patches of such diffuse (and often undependable) resources as scrub oak and Prunus remains, but the single reference to this practice might represent an individual case, or a situation in which productive stands of these plants might occur in close proximity to a village. There are large areas where these resources are available, though not always concentrated, and it is difficult to conceive of all such resources being specifically owned. Conversely, it is conceivable that agave resources were not always open to all comers. The desert valleys, particularly Canebrake, are nearly closed geographical systems, with well-defined major villages which may have controlled the resources in the valley itself while more open habitats, such as the Vallecito Creek drainage, were without restriction. While more than one lineage may have had villages in the same valley (Cline, 1979:13-17), it is not presently known whether the valley resources were open to all, or divided into specifically owned districts.

Concepts of plant distribution and resource ownership alone are not sufficient to define land use patterns. In the case of major permanent villages, a dependable water supply was a prime requirement -- in large part because of the need for water in the processing of plant foods -- but other factors such as favorable living areas, the presence of suitable bed-rock outcrops for milling, or proximity to major routes of travel (Which came first? Do trails connect villages, or were villages established along trails?) might be important factors.

Water, for example, appears to be a requirement for a well-defined permanent or seasonal village, as might be expected. At times, however, the requirement of permanent water might be overridden by the presence of a major resource. Both Lee (1937:178-187) and Kelly (1977:41) document the maintenance of pinyon camps in areas where water was at a premium and had to be carried long distances. In such instances, major and extensive, albeit temporary, settlements would occur in the absence of a dependable eating supply. La Rumorosa is a prime example of this pattern in the pinyon country, and the extensive "village" areas around the south flank of Table Mountain may be examples of a similar pattern in the agave habitat.

Other factors may also be important in determining site locations and settlement patterns. Jacumba itself, for example, could have been important for the curative powers of the hot springs. In any case, the springs would be an



excellent place for several clans to converge during the winter months. Concentrations of rock art in the area around the south flank of Table Mountain, and elsewhere such as La Rumorosa in Baja California, suggest that there may be ritual/ceremonial reasons for coming to certain areas, although an equally logical interpretation would identify ritual activity such as the production of rock art with the gathering of diverse groups of people in areas of resources which were open to all for exploitation. Few of these assumptions regarding non-objective factors in settlement and land use patterns are directly testable, but they remain as possibilities to be considered in interpretation of the archaeological record.

### Preliminary Interpretive Models for Settlement Patterning

Thus far the archaeological analyses have been summarized and pertinent ethnographic considerations discussed. It should be apparent from these that the pattern observed is the result of a poorly documented prehistoric cultural system(s) which will require many more years of archaeological research before it can be adequately understood. Toward this end, this section provides a synthesis of the archaeological and ethnographic data within the context of a series of alternative, complimentary models. The models developed are primarily heuristic devices which illustrate how the observed settlement pattern may be interpreted. Each is concerned with "explaining" settlement variability and has its own assets and shortcomings for this. All, however, address basic subsistence-settlement issues. At various junctures examples are given using the McCain Valley data showing the model's applicability. No grand unified model will be presented. Instead, the intent here is to demonstrate that implications derived from modeling are useful for not only explaining much of the observed patterning but also for generating hypotheses which later may be tested as more data become available.

Before proceeding two assumptions must be stated, both of which are functions of data limitations generally symptomatic of the overall sample size and confidence limits imposed. First, given the lack of observed temporal variability, it is impossible to consider dynamic models. Therefore, the systems will be assumed in a state of equilibrium and closed to outside influence. Second, since definitive formal-functional algorithms could not be established from the analysis, only a rudimentary settlement classification dichotomy will be used, differentiating between habitation and extractive site types. Though in certain instances intra-type variability will be hypothesized and implications considered, emphasis predominantly focuses on these two basic types.



As a starting point, Schiffer (1972) proposes an approach which defines various relationships between behavioral systems and their material outputs. Termed cultural formation processes, he identifies four different types. The process discussed here is the S-A cultural formation process, or that whereby materials are transformed from the systemic context (behavioral system) to the archaeological context (archaeological record). This is recognized most commonly as "cultural deposition," an axiom which states that most activities of any ongoing behavioral system will result in tangible contributions to the archaeological record of that system (1976:28). The basic units within each component are the element or artifact and the activity for the archaeological and systemic contexts, respectively. Activities and their spatial distributions determine the element aggregates observed at sites. Archaeological settlement patterns are thus spatially (and temporally) discrete artifact aggregates which relate directly, through set transformation rules, to the type and frequency of various activities performed. Regardless of the kinds of activities conducted, S-A processes are divisible into two basic types: normal and abandonment.

Normal processes are those which characterize an activity area throughout its duration of use. The three major kinds of normal S-A processes are discard, disposal of the dead, and loss. Abandonment processes begin operation only when activity areas are being abandoned (ibid. : 30).

Since the concern is with subsistence activities, it should be possible to posit a given set of activities (the systemic content) and derive from these the corresponding archaeological elements under "optimal" conditions. The spatial and temporal contexts of these determine the specific artifact outputs, and combined, result in the observed settlement pattern.

Several S-A transformation models are proposed by Schiffer. The behavioral chain model, "used to systematize activity hypotheses and generate their test implications" (ibid. : 49), is perhaps the most appropriate given its format and simplicity. Accordingly, each distinct activity is defined by seven components:

1. a specific behavioral description of the activity;
  2. the nature of the constituent human and non-human energy sources;
  3. element(s) conjoined or associated with the one under consideration;
  4. time(s) and frequency of activity performance;
  5. the locus of activity performance;
  6. points at which other elements integrate with, or diverge from, the element under consideration;
- and



7. the pathways created to the archaeological record by the outputs of activity performance (ibid. : 49).

If, for example, interest lies in modeling the S-A transformations for a specific subsistence activity such as acorn processing (disregarding acorn procurement, consumption, or discard), then defining each component above would result in a hypothetical, expected output into the archaeological record which could be tested against observations. This would consist of a set of permanent and portable milling implements, hammerstones, and leaching paraphernalia as expected formal outputs, with the corresponding temporal and spatial components determined by resource seasonality and habitat distribution.

With respect to subsistence behaviors, one could thus posit a series of hypothetically discrete subsistence activities ranging from long-term residency to one-time agave exploitation. For such activity, then, there should be a site type(s) with specific locational characteristics, i.e. environmental associations and spatial distributions, such that the form of subsistence strategy and pattern of settlement covary.

It should be noted, however, that the model excluded certain variables necessary to explain temporal and spatial variability and generally lacks operational devices for explaining the interaction between the components. Thus, if "culture is seen as part of a broad system in close interdependence with man's biophysical environment," (then) "artifacts and social organization are no longer seen as entities in themselves, but are viewed in relation to one another and to the general ecosystem of man and nature" (Watson, et al., 1971:91). This interaction between cultural behavior and the natural environment is illustrated below; note that the emphasis in behavioral chain modeling is only between the last two components.

$$\begin{array}{ccccc} R & \leftrightarrow & A & \leftrightarrow & S \\ 1 \rightarrow n & & 1 \rightarrow n & & 1 \rightarrow n \end{array}$$

where: R is resources; A is activities; and S is sites. Here, the relationship between differing resources and activities may be understood as subsistence strategies. (Operants denote predominant relationship directionality, though causality should not be inferred, given the model's heuristic purpose.)

Natural resources range from purely physical variables, such as landform and geology, to biological. Those considered in the analysis above include: landform, slope, geology, hydrology, and vegetation. While only a partial listing, it was sufficient to demonstrate that natural and cultural



resources covaried formally and spatially. Also, though not measurable, it was possible to infer the existence of seasonal variability given the fact that floral resources could be exploited at only certain times.

Biological variables will be evaluated first. According to Beaton, habitat associations can be described by three basic measures:

1. Species Diversity -- for our purposes species diversity carries the sense of species richness (N/sq.Km).
2. Resource Distribution -- we can imagine two polarities of spatial resource distribution. First, resources may be evenly distributed such that individuals of a species are maximally dispersed from other individuals of that same species. A sampling then of any part of the universe would yield resources in the actual relative abundance that they maintained throughout the habitat. This has been called fine-grained distribution. On the other hand, we can imagine resources as tightly clustered within a species. Here, a limited random sample would not yield resources in their actual relative abundance.
3. Seasonal Difference -- this measures for the most part the kind of variation observable on gross longitudinal transects. An area of low seasonal difference might have no more than 2°C (M.D.T.) difference between January and July. Rainfall regime, plato-period, etc., might be relatively constant throughout the year. The opposing case, a highly seasonal habitat, is what we experience in temperate latitudes (1971:41).

An application of this scheme for biological resources within the sample area is below (Table 39). Faunal resources are not evaluated given their high mobility, and the low visibility of potentially exclusive hunting or butchering archaeological sites. The floral resources tabled are those identified in the ethnography as the most important. Each plant is classified according to its region of occurrence, distribution type, and season of exploitation or harvest.



TABLE 39. Critical Plant Resource Attributes

| <u>Plant Resource</u> | <u>Region</u>                                                   | <u>Grain Distribution Type</u> | <u>Season or Time of Exploitation</u> |
|-----------------------|-----------------------------------------------------------------|--------------------------------|---------------------------------------|
| Agave                 | Table Mtn.,<br>Desert Valleys<br>and Slopes                     | Fine                           | Spring                                |
| Pinyon                | Outside of Study<br>Area to South<br>and North                  | Fine                           | + August                              |
| Prosopis              | Desert Valleys<br>V-C                                           | (extremely)<br>Coarse          | Summer<br>(April to August)           |
| Prunus                | Throughout the<br>entire Study<br>Area                          | Medium                         | Late Summer/<br>Early Fall            |
| Quercus               | Scrub: Through-<br>out<br>Coastline: McCain<br>Black: Mountains | Coarse<br>Medium<br>Fine       | Fall<br>(October to<br>November)      |

(Coarse = aggregated, dispersed/Fine = evenly distributed)

Variability in hydrologic phenomena results in part from different landform types and subtle differences in the rain shadow - related precipitation. While springs occur throughout all regions, drainage morphology is quite dissimilar. McCain is a large, roughly elliptical basin. The northern portion constitutes the upper drainage of Bow Willow Creek and other minor tributaries which flow east and north in the desert valleys and canyons. The southern half of the basin drains into Tule Creek. Oriented on a northwest to southeast diagonal just west of the sample universe, it eventually flows east into Carrizo Gorge terminating in the desert valleys northeast of McCain. Both northern and southern drainages are highly bifurcated networks with dendritic patterns. On the other hand, the desert valleys immediately abut the peninsular range and are confined by steep mountain slopes along the perimeters. Here the major drainages tend to occur in the center of the valley floor with their numerous tributaries branched at perpendicular angles from mountain slopes. Table Mountain is somewhat of an anomaly. It is similar to McCain with regard to hydrology, though geologically and topographically quite unique. The vegetation is transitional, a cross between desert and mountain types.

Regional resource variability is therefore quite evident within the sample universe. It is essentially a heterogeneous



area which can be divided into minimally two distinct natural environs even though broadly considered transitional. These micro-environments are the desert mountain-valley systems and the mountain valley systems. As grossly dichotomous resource aggregates, much of the following is based on this differentiation assuming relative intra-class homogeneity.

Given that the regional environments vary, it would seem reasonable to infer corresponding settlement pattern differences. Archaeological implications cannot immediately be drawn, however, without consideration of the posited activities and related subsistence strategy linkages. Recall that with the limited data and absence of formal-functional algorithms, it was possible to distinguish only between habitation and extraction sites, even though a continuum is probably represented. Both site types can be defined as a set of fundamental subsistence behaviors. Following Schiffer (1972), a modified flow model for consumable elements may be used as input for the chain model previously discussed to derive the specific outputs into the archaeological context (see Figure 12).

As defined here, extraction sites are those where a limited range of activity types occur: either procurement, processing, or both. In conjunction with the range of natural resources, each extractive task would result in different archaeological outputs, or site types, from agave roasting pits to hunting-related loci, for example. Habitation sites would, under this scheme, be expected to exhibit outputs from the full range of subsistence/maintenance activities.

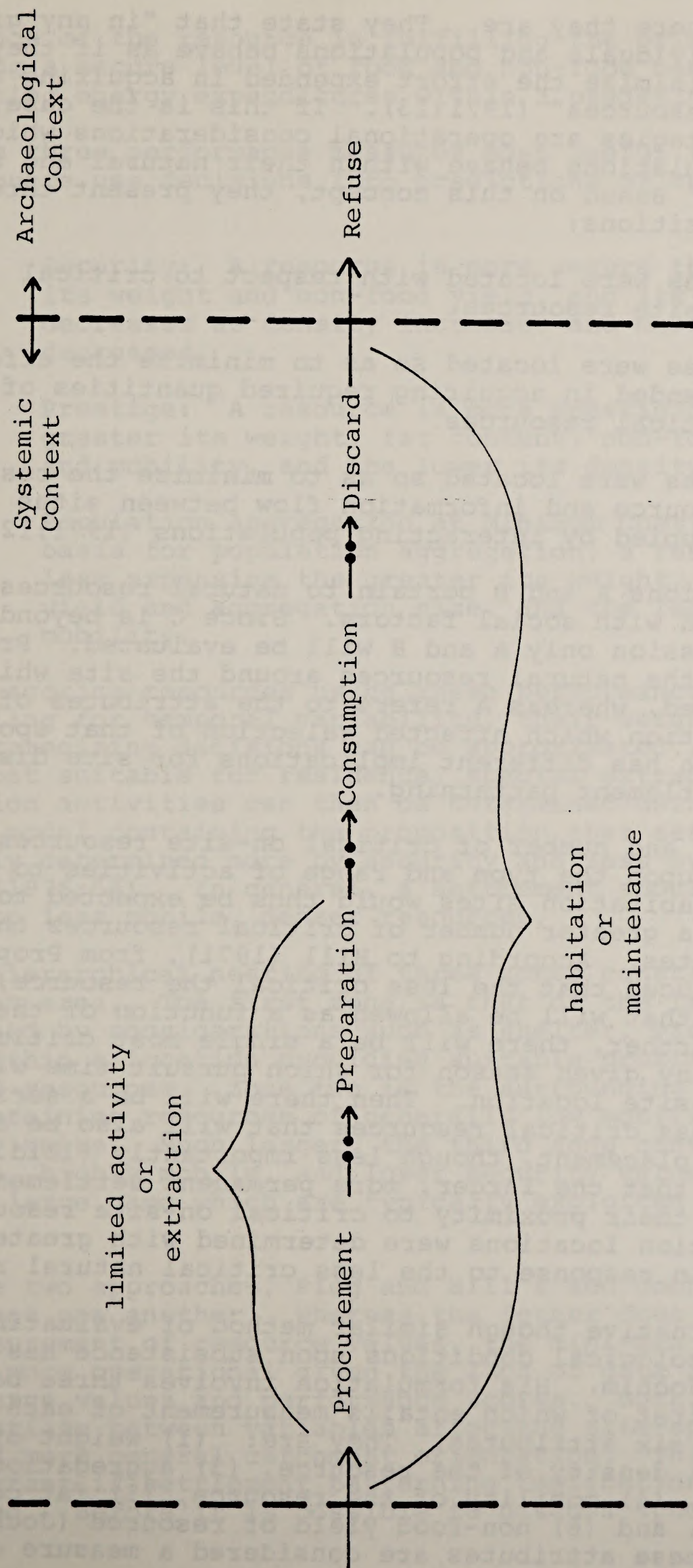
Advantages of the activity-site model are that: (a) on the basis of their limited site formal variance it is possible to classify many functionally problematic sites as extractive, and (b) the archaeological implications for habitation sites are not restricted solely to consumption and "maintenance" activities (compare Binford and Binford, 1966). The presence of elements generally construed as procurement or processing related at habitation sites do not contradict the classification; they are simply treated as elements indicative of other activities which may have been factors in site location selection.

Because sites are the spatial loci of the requisite subsistence activities, decisions affecting selection of their locations were neither random nor mechanical. Instead, they were the product of conscious decision-making processes and reflect unconscious behavior resulting from selective pressure, i.e. evolutionary adaptation. Whether conscious or unconscious, the behavior is the result of a set of decisions which determine the appropriateness of conducting certain activities at certain locations at certain times: subsistence "strategizing."

The concepts of maximization and minimization are central to the approach taken by Plog and Hill in explaining why sites



FIGURE 12  
Flow Model For Consumable Elements



- Notes: 1)  $\text{---}\bullet\bullet\rightarrow$  means opportunity for storage and/or transportation  
 2) potential activities represented in center of diagram  
 3) potential site types using dicotomy for each set of activities (modified from Schiffer 1972).



are located where they are. They state that "in any given situation individuals and populations behave as if they intended to minimize the effort expended in acquiring a particular set of resources" (1971:13). If this is the case, then mini-max strategies are operational considerations which explain how human populations behave within their natural and social environments. Based on this concept, they present three general propositions:

- A. Sites were located with respect to critical on-site resources.
- B. Sites were located so as to minimize the effort expended in acquiring required quantities of critical resources.
- C. Sites were located so as to minimize the cost of resource and information flow between sites occupied by interacting populations (1971:12).

Propositions A and B pertain to natural resources, while C is concerned with social factors. Since C is beyond the scope of this discussion only A and B will be evaluated. Proposition B refers to the natural resources around the site which the group exploited, whereas A refers to the attributes of a specific location which affected selection of that spot over another. Each has different implications for site distributions and settlement patterning.

The type and number of critical on-site resources necessary depends upon the type and range of activities to be performed. Habitation sites would thus be expected to be located near a greater number of critical resources than extractive sites. According to Hill (1971), from Proposition B it can be deduced that the less critical the resource, the more pursuit time that will be allowed as a function of the site location. Further, there will be a single most critical resource at any given season for which pursuit time will be minimized by site location. Then there will be a series of relatively less critical resources that will also be determinants of site placement, though less importantly (ibid., 60). This implies that the larger, more permanent settlements were selected for their proximity to critical on-site resources, while extraction locations were determined with greater flexibility in response to the less critical natural resources.

An alternative though similar method of evaluating the effects of ecological conditions upon subsistence has been proposed by Jochim. His formulation involves three basic steps, the first of which entails measurement of each resource according to six attributes. They are: (1) weight of the resource, (2) density of the resource, (3) aggregation size of the resource, (4) mobility of the resource, (5) fat content of the resource, and (6) non-food yield of resource (Jochim, 1976:23). These attributes are considered a measure of the



importance of the resource in fulfilling the primary goals of attaining a secure level of food and non-food needs, and maintaining energy expenditures within a predefined range.

The three performance measures most useful for transforming resource use decisions into predictions of spatial behavior are:

1. Security: A resource is more secure the greater its weight and non-food yield, and its risk decreases as density increases and mobility decreases.
2. Prestige: A resource is more prestigious the greater its weight, fat content, non-food yield and mobility, and the lower its density.
3. Population Aggregation at Minimum Cost: As a basis for population aggregation, a resource is less expensive the greater its weight, non-food yield and aggregation size, and the less its mobility.

By scoring resources using these performance measures and controlling for temporal variability, their weight in subsistence-strategizing decisions can be approximated. The types of areas most suitable for residence, special extraction, and production activities can then be determined using a modified gravity model containing the proposition that settlements are spatially determined more by security and less by prestige scores (1976:54). In general, a settlement should be located closer to less mobile, denser resources.

A hierarchical nesting of three zones constitutes a catchment area. The first zone is that of the immediate site, determined by considerations such as shelter, view, fuel, and water within a location providing suitable proximity to secure, critical resources. Zone two is the surrounding gathering area containing resources of generally low mobility and high security value. Much larger, the third zone contains high prestige, highly mobile, and lower security valued resources such as large game which are typically exploited by the adult males.

The two approaches, Plog and Hill's and Jochim's, complement one another. Whereas the former does not provide for measurement of resource values, the mini-max concept is perhaps more operational given the lack of data for calculation of resource values and performance scores. Both, however, differentiate between variables affecting site-specific location and more general catchment orientation. This distinction is important if settlement patterning implications are to be developed. Before it is possible to discuss specifics for the



McCain Valley Study Area, one final topic must be covered: measurement of settlement pattern variability.

In many respects it is possible to describe settlement patterns in a manner similar to that proposed by Beaton for habitat associations discussed earlier in the text. Measurements of the spatial characteristics of any given site type include site density (N/sq. km.) and distribution pattern, i.e. from random to clustered. If one considers that settlements are aggregates of different site types, it is possible to develop ratios between different site types, and relative frequencies of a site type as measures of species diversity. Finally, it is possible to vary the overall spatial frame and examine intra-regional and inter-regional pattern similarities or differences.

Since it has been argued that settlement patterns are related to a region's natural resources, it should then be possible to find corresponding spatial distributions. Yet analysis of the probabilistic sample detected only a few significant associations or distinctions. Should one then assume that with these few exceptions the pattern is essentially random, or that detection was lacking because of data limitations and operational difficulties? In the remainder of this section it will be argued that the latter is more appropriate.

Starting with those statistically significant results from the analysis, the clearest in terms of the discussion above is agave roasting pits: a significantly higher density of roasting pits was observed in Vallecito-Canebrake than in either McCain Valley or Table Mountain sections. The level of spatial differentiation is inter-regional for this site type whose occurrence correlates significantly with the presence or absence of agave. Yet beyond this rather obvious conclusion, what explains its distribution characteristics within the desert regions? The intra-regional pattern varies from desert valley to desert valley in relative density; but within each, the spatial distribution appears essentially random. With respect to the relative density between, for example, the Canebrake and Vallecito valleys, this can be understood as a function of the relative abundance or density of agave. The randomness factor is the result of the particular procurement/processing mode within each area.

Procurement, exploitation of the resource, was a seasonal activity and one which, according to ethnographic accounts, was intensive in terms of shortness of duration and involvement of great numbers of people. Processing occurred within close proximity to the source of procurement. This, it would seem, was probably related to transportation difficulties and raw material requirements. That is, the individuals were behaving so as to minimize energy expenditures during procurements and processing by conducting their activities at the point of exploitation in space and time. Reconstruction of the



activity specific systemic context thus enables one to derive the corresponding archaeological outputs. "The pathways created to the archaeological record by the outputs of activity performance" (Schiffer, 1976:49), as described above would result in the feature recorded as an agave roasting pit with set spatial and temporal variabilities. The apparent randomness is therefore a function of resource distribution and density which may in fact approximate a random pattern intra-regionally, but not when viewed from the inter-regional spatial context.

The agave roasting pit is but one example of many potentially different extraction site types. It is also one where procurement and processing occur almost simultaneously within close proximity to one another. Since this does not necessarily have to be the case, are there other instances where this occurs for other resources, and if so, why? Conversely, if both activities were not performed at the same loci, why was the extractive strategy different?

Unfortunately there are no other extractive site types with definitive resource type to site type correlations. Sites with milling components, while minimally extractive by definition, are indicative of processing at many different stages and of potentially numerous resources. All of the plant resources tabled above would be considered "critical" or "secure;" some, however, given their particular spatial distributions would be expected to affect specific site locational determinations differentially assuming a mini-max strategy. Furthermore, it is argued that purely procurement sites would be difficult to detect unless processing also occurred as the roast-pit situation. It is therefore suggested that only in those cases where transportation is prohibitive due to resource bulk or weight will processing occur at the same point as procurement. Where it is not, the resources will be gathered and transported to either a common local processing loci or the base camp. This may differ for non-food resources such as lithic procurements. But the basic proposition still holds, since on-site procurement and processing, i.e. reduction to preform stages, would be necessary to some degree given resource weight (and other factors affecting lithic selection) and to minimize the energy expenditures required for transportation in its raw state. This in part may explain the great number of sites with lithic components in the Table Mountain region where large, diffuse quantities of good concoidal lithic material occur. Only three site types did not exhibit lithics in Table Mountain, whereas six and nine did not for McCain Valley and Vallecito-Canebrake, respectively.

Assuming that resource grain or distribution type and density are factors which affect the degree of spatial differentiation between procurement and processing activities, and that bulk/weight is relatively equal, then it is possible to hypothesize that resource grain/density will affect the spatial distribution of sites with extractive components through



mini-max principles. Of the major plant resources not considered, prosopis, prunus, and quercus are all coarse to medium grained resources. Although relative distribution type and density vary across regions, all require milling for processing. It can be posited that, contrary to the agave-roasting pit relationship, each individual plant would not have a corresponding processing element in one-to-one proportions (though it should not be construed that the agave-roasting pit is one-to-one). In each instance, the seeds would be gathered, the point of procurement without probable archaeological outputs, and then transported for processing which would result in the occurrence of milling implements. Sites with milling components should thus occur throughout a region with relative predictability and of a distribution controlled by density and grain size of the aggregate natural resources, since a central location would be desired to reduce energy expenditures. Similarly, other extractive sites would have different requirements based on resource type and procurement/processing mode.

While as mentioned it is not possible to posit definitive functional extraction site classifications such as that for agave roasting pits, the implications are nevertheless that gross formal variability should be related to spatial resource differentiation. This is precisely what resulted from analysis of hydrologic variability. Not only was a statistically significant difference observed between habitation and extractive sites for distance to Rank II streams or springs, but a consistent pattern was noted for four major classes of extractive site types (see Table 40). According to that analysis what were originally classified as temporary camps (02) could be subdivided into definite habitation sites and what would probably be more appropriately classified as large extraction sites with milling components. The mean distances in kilometers are listed in Table 40.

Statistical tests applied to the hydrology data resulted in the second significant finding: temporary camps (habitation sites) are significantly closer to Rank II or higher streams or springs than other site types (extraction). Water would thus have been considered a critical resource in habitation site locale selection, as would be expected based on Proposition A of Plog and Hill's and Jochim's gravity model for site-specific locational factors. These do not, however, necessarily explain the consistent pattern noted above for extractive sites. For milling stations it can be proposed that the relatively close association with hydrologic features may be due to both the natural habitat of oak, prunus, and mesquite resources and the use of water in the processing procedures. The procurement and processing activities would therefore be in proximity to one another, thereby minimizing effort expenditures for both activities. This situation is quite similar to that for agave exploitation except that the agave habitat and its processing are not contingent upon water in the form of stream or spring sources.



TABLE 40

## Distance to Rank II Streams or Springs by Site Type

| <u>Site Type</u>                                                                 |             | <u>Mean Distance<br/>to Rank II<br/>Stream</u> |
|----------------------------------------------------------------------------------|-------------|------------------------------------------------|
| HABITATION:                                                                      |             |                                                |
| Midden or IV-IV BP Type 2                                                        | "Type 1"    | .08 km                                         |
| EXTRACTION:                                                                      |             |                                                |
| Milling Stations: Non-midden,<br>including                                       | Type 2      | .45 km                                         |
|                                                                                  | Type 9      | .38 km                                         |
|                                                                                  | Type 10     | .40 km                                         |
|                                                                                  | Type 21     | .40 km                                         |
| Sherd Only Scatters: Non-midden,<br>Scatters, and Isolates,<br>including         | Type 12     | .64 km                                         |
|                                                                                  | Type 13     | .52 km                                         |
| Roasting Pits                                                                    | Types 14-15 | .67 km                                         |
| Sherd/Lithic or Lithic Scatters:<br>Non-midden, Scatters,<br>Isolates, including | Types 3-4   | 1.10 km                                        |
|                                                                                  | Types 5-7   | 1.10 km                                        |
|                                                                                  | Type 8      | 1.00 km                                        |

The remaining extractive classes are problematical; it is difficult to posit either function or resource exploitation foci. However, with regard to the latter, it can be safely assumed that whatever the resource type, their spatial distributions were either independent of or perhaps negatively correlated with the aforementioned hydrologic features. This assumption should not be construed as implying resource importance or criticalness, but given a mini-max strategy as shown to be operational for the exploitation of the other resources, one can hypothesize that said undetermined resources occurred at greater distances away from the major streams and springs. These would probably be fine-grained and widely dispersed resources which presumably did not require water for processing. In the case of lithic scatters it is possible that they may represent exploitation of faunal resources, though quarrying and lithic reduction may be equally plausible in several instances. It is also possible that certain sites may predate the Late Prehistoric ceramic phase, and thus represent San Dieguito or Pinto/Amargosa affiliation.



For habitation sites both resource catchments and site-specific availability were apparently considered. In conjunction these factors should limit the number of potential locations selected. First, site-specific variables such as shelter, view, fuel, and water should be immediately available. If several locales are equally suitable, selection would presumably then be based on: (a) the highest density of critical food resource within reasonable proximity, and/or (b) the most central location within the hypothetical catchment to minimize energy expenditure and maximize area-wide resource acquisition. With respect to this last statement, Plog and Hill note that,

(s)ettlements or base camps were not located where they were for the exploitation of a single resource. They were the center of exploitative activities in general. There (sic) location was affected by the distribution of the whole set of resources exploited by the population in question, while the distribution of limited activity sites was affected by only one or a few of these resources (1971:13-14).

Furthermore, it is suggested temporal and spatial resource variability should also affect site location, especially when within the generalized catchment several suitable alternative locales exist, at one of which a greater number of resources occur in close proximity. For example, that "type 1" major habitation sites are on the average within .08 kilometers of a Rank II stream or spring does not aid in predicting where along the stream the site locale would have been selected. Yet, based on the above propositions, the probable "best" location would be in the approximate center of the seasonally determined catchment and where the greatest aggregate of immediately available resources occur. Though difficulties encountered in operationalization of vegetation as a related variable may have resulted in detection failure, in two instances it is readily apparent that these factors affected locale selection: McCain Valley and Vallecito-Canebrake. The major habitation loci in Canebrake and Vallecito occur within short distances to substantial mesquite groves, a resource associated with permanent surface and ground water supplies. For McCain Valley, the majority of the larger habitation sites occur west of the sample area. This area, surveyed by Melissa Johnson (1979), contains the greatest density of Coast Live Oak within the valley along with an extensive meadow grassland and abundance of surface water.

A group's subsistence strategies are attempts to solve problems of resource exploitation in an efficient and secure manner. Since no single resource can exclusively provide all sustenance or nutritional needs, and be consistently available without risk of over-exploitation, a series of resources ranging from critical to famine, food and non-food must be



obtained or secured. Hypothetically, for each resource demand a separate mini-max behavioral strategy could be posited and studied in isolation. Yet in reality, the obvious necessity for exploitation of numerous requisite resources results in considerably more complex, compound strategies which are difficult to detect at the archaeological level. Focusing on major economic plant resource variability serves well to illustrate this problem. If those plant resources in Table 39 are assumed to be of relative subsistence importance and each has different spatial distributions, then each would in some manner necessitate a separate extraction strategy. Co-occurrence of several such resources in any given region thus results in strategic complications which could be compounded by temporal availability conflicts should two or more have seasons that coincide.

In a recent article, Binford (1980) proposes different subsistence-settlement systems, each with their respective organizational components, "mapping-on" or "logistics," and consequences for inter-site archaeological variability. The two alternative systems are those of foragers and collectors. Simply put, "Foragers move consumers to goods with frequent residential moves, while collectors move goods to consumers with generally fewer residential moves" (ibid. : 15). The forager strategy is one where a group "maps-onto" resources through residential moves and adjustments in group size. Typically, they do not store foods but range out from the residential base daily to procure resources, returning later in the same day. Normal and abandonment S-A processes characterizing this strategy result in basically two spatially and formally distinct archaeological sites: the residential base and the location. The former, as the daily center of subsistence activities, is the locus where processing, manufacturing, and maintenance activities occur. Given variability in residential mobility, it is to be expected that group size, duration, and distance between sites will also vary, thereby affecting archaeological visibility, i.e. the quantity of remains may differ so radically between residential sites that the smaller deposits may be difficult to identify as such. The "location" is where exclusively extractive tasks are performed. Since low-bulk daily extraction occurs region-wide wherever resources are encountered, activities are of short duration and spatially diffuse resulting in archaeological sites of low density and artifactual aggregation; they appear as large diffuse scatters, again of low archaeological visibility.

By virtue of their different procurement strategies, collectors may be expected to generate three additional basic site types in addition to the residence and location: the field camp, the station, and the cache. Field camps serve as temporary residential locales primarily for habitation and maintenance, but unlike the larger, more permanent residential base, they vary according to the nature of the targeted resource.



The highly specialized, task-oriented behavioral organization of collectors generate two special purpose sites in addition to the location: stations and caches. Stations are for organization where information is exchanged and strategies planned for task groups involved in exploitation of specific resource targets, primarily the hunting of highly mobile game animals. Since procurement is accomplished by small task groups for transportation and consumption by the larger home-based group, success results in large bulk, thus requiring temporary storage. This field storage usually results in construction of special facilities, termed caches. With respect to the archaeological record, the collector system with its logistically organized, resource-targeted task orientation, results in a greater range of functionally discrete site types of high visibility. Inter-site variability is therefore expected to be not only greater than that for foraging systems, but also increases as a function of resource spatial differentiation and targeted number increases. In summary,

collectors are characterized by (1) the storage of food for at least part of the year and (2) logistically organized food-procurement parties. The latter situation has direct "site" implications in that special task groups may leave a residential location and establish a field camp or a station from which food-procurement operations may be planned and executed. If such procurement activities are successful, the obtained food may be field processed to facilitate transportation and then moved to the consumers in the residential camp (ibid. : 10).

The proposed primary cause or source of subsistence-settlement strategy variability is environmental. As resource procurement must be conducted in an efficient (mini-max) and secure manner, resolution of resource availability conflicts necessitates differing behavior adaptations. Two environmental factors are identified: conditions of resource spatial incongruity and those of resource temporal incongruity. Solving the problem of resource incongruity is seen as a delicate balancing act; residential mobility will not resolve spatial incongruity -- a move to one location reduces access to resources at the other -- and while storage reduces temporal scheduling conflicts, it tends to increase the problem of spatial incongruity. Therefore,

if the argument is made that incongruity among critical resources, whether temporal or spatial, is a condition favoring logistical strategies and a reduction in the role of residential mobility, it must also be realized that any condition which either (1) increases the numbers of critical resource and/or (2) increases the climatic variance



over an annual cycle will also increase the probability of greater incongruities among critical resources (ibid. : 15).

Given that both spatial and temporal resource incongruities existed in the study area, how then did the late prehistoric populations devise various subsistence-settlement strategies to solve those problems and what are the archaeological implications? It is known that storage of food resources was practiced, particularly of acorns, and that also residential mobility occurred in the form of seasonal transhumance. From Binford's discussion it would therefore appear that both contrasting strategies were employed to some degree. Yet, as he notes, it should not be construed that there are necessarily two polar types of subsistence-settlement strategies, but that a graded series from simple to complex is probably more representative of real systems. Nevertheless, if we assume that all clans could not have access to or possession of identical territories, then variability in territory resource composition should affect procurement strategies resulting in formation of different archaeological site patterning detectable at this level of investigation.

Delineation of clan territories is essential for any further interpretation, although unfortunately it is also problematic. The ethnographic summary provided above will therefore of necessity be assumed valid and reasonably accurate. Within the three major sample regions two generalized land use patterns can be identified. The first consists of a heterogeneous territory comprised of two contrasting environmental components: the desert valleys within the sample area, and the peninsular range zone outside and to the west. This is the pattern described by Tom Lucas (Cline, 1979): Groups occupying the region practiced a bipolar subsistence-settlement strategy exploiting highland black oak resources in autumn and wintering in the desert valley to the east.

South of this, the topography changes as the Peninsular Range gradually flattens into upland rolling hills approaching the international border. Here ethnographic accounts conflict and precise data are lacking. That which can be ascertained indicates a pattern unlike that for the territories immediately north. It is suggested that the McCain Valley and Table Mountain/Jacumba regions were occupied by groups of mixed clan affiliation. Major residential sites were located within the valley from which the clans dispersed into their respective territories exploiting available resources. A difficulty arises in that not only are the clan territories undefined (since accounts were recorded post-contact), but definitive information is lacking with respect to their mobility pattern. Thus, it cannot be determined whether they resided in this region year-round, or migrated east into the desert or south in the pinyon groves across the border.



Regardless of this problem, the McCain and Table Mountain regions are characteristically upland zones with overall resource type, spatial and temporal distributions different from those of the lowland desert valleys. Neither of the aforementioned land use patterns is represented in whole within the sample universe with respect to their territories. Instead, there is a juxtaposition: for the northern only the desert areas were sampled, while for the southern only the uplands. For each, the resource base represented is the opposite of that for the other. Different subsistence-settlement strategies would therefore be required for each.

The bipolar pattern documented by Cline (1979) for the Kumeyaay consisted of the exploitation of two distinct environs. Groves of black oak growing at high elevations along the western edge of the study area in the Laguna, Cuyamaca, and Volcan Mountains were exploited in autumn through acorn-gathering expeditions. Mountain villages were not necessarily the black oak gathering area, however, since the gathering expeditions probably found daily procurement and transportation back to the residential base inefficient. Archaeological evidence suggests that gathering parties established temporary field camps away from the village where extractive activities could be conducted. Within a set radius of these, acorns were procured and then given either preliminary in-field processing or transported back to the field camp. Here they would be processed and consumed as needed though the bulk were undoubtedly put into storage. The comprehensive picture is one of what Binford terms a collector system, the logistically organized, resource targeted strategy. Archaeological expectations of this strategy fit those observed in the record and mentioned in ethnographies. The residential base or village is documented, but it is the field camp which serves as the temporary base for daily activities, both extractive and maintenance. The location is also highly visible in the ubiquitous bedrock milling loci diffusely distributed throughout the peninsular range. Caches, however, are not so visible though they are well-documented ethnographically. Stations may not be represented or, given their hypothetical functions, may have been served by field camps.

Following the acorn harvest, the clans migrated to the east into the warmer desert valleys for winter and spring. The cached food reserves were transported down the steep slopes along well-documented trail networks, tying Mason Valley and Canebrake with villages in the Laguna Mountains and Cuyapaipe areas, respectively. Here the groups subsisted on the stored reserves and exploited local ancillary resources until the agave ripened. At this time a different strategy would be employed, one similar to the foragers. Ranging out from their villages, or if need be establishing new ones, small foraging parties would exploit the agave, processing it in roasting pits and returning to the residential base the same day. While other



resources were probably exploited, the agave was the major targeted resource. Under these conditions, inter-site variability would be expected to decrease, the predominant types being the residential base and the location. No mention is made of the summer residency location. However, as the mesquite is available at this time and known to have been intensively exploited, then presumably some number of individuals remained in the areas. A similar situation is presented by the occurrence of known exploited autumn resources, the scrub oak and prunus series. While neither was probably as intensively exploited as mesquite, it can be suggested that year-round residency was practiced. In late summer through the black oak acorn harvest, though, possibly only a small "caretaker" group remained, living on resources of slightly lesser security value. Should any damage occur to the black oak resource, these later would then become highly important and the archaeological record should reflect periods of stress given that the subsistence-settlement strategy would be different from that of the predominant spring foraging pattern.

For the McCain Valley and Table Mountain/Jacumba region the archaeological record should appear similar to that for the autumn bipolar pattern, but with some probable modifications. The similarities would be a function of the basic subsistence-settlement strategy for acorn procurement and processing. Variability between the two, however, may be assumed given (a) the uncertainty of the number of clans inhabiting the region and (b) the possibility that the coast live oak resource may have been divided into different ownerships and that within each, the clan located its village. This latter situation is dissimilar to that noted for the black oak exploitation strategy, in that not only are the McCain Valley oak resources owned, whereas the black oaks were not, but also the residential base locations are different. There would therefore probably be no need for field camps during acorn procurement in the McCain Valley region since the major residential base would suffice. Yet, assuming explicit resource ownership, should resource yield decrease for any reason, then the system would be put under stress resulting in increased competition for resource and modification of the clan's (or clans') subsistence-settlement strategy. During the autumn months several alternative solutions may have existed: either relocation into the black oak regions to the northwest or increased exploitation of other local resources such as Prunus. If the latter occurred, then given the Prunus spatial distribution type, a forager mode may have been more appropriate.

Because of discrepancies in the ethnographic data, it is not known whether the McCain Valley groups resided in the vicinity year-round or migrated east into desert valleys and south into Baja California. It is difficult to conceive of conditions whereby any but a small number of groups could subsist solely on the resources within McCain Valley, however. Even if this region did serve as an area for permanent village



bases (similar to Cahuilla), in all probability it would have been necessary to establish field camps in outlying regions to procure additional resources. One would thus expect the predominant archaeological record to reflect a subsistence-settlement strategy related to intense acorn exploitation. The occurrence and number of field camps, caches, and locations would be dependent upon the resources distribution. As the greatest density of coast live oak is found in the valley center, along with other critical resources, major habitation sites would be expected there. But both coast live and scrub oaks and *Prunus* occur in varying densities throughout the remainder of the valley, and it is in these areas that field camps would have been established along the mini-max principle.

The implications for regional inter-site variability discussed above appear to be corroborated by the inventory results and thus serve to explain the different settlement patterns. Detailed elaboration and definition of the respective settlement-subsistence strategies will, however, necessitate additional research above and beyond the level of that herein described. Throughout this section an attempt has been made to explain the possible causes of the observed settlement variability, even though statistical analysis detected so few significant results. In presentation of the various "explanations," or perhaps more appropriately, interpretive models, it has been implicitly argued that the reason for the paucity of significant results is not that none exist beyond those discovered here. Many recent analysts working on similar projects, i.e. Class II inventories or other probabilistic surveys, have suggested this when faced with a lack of environmental correlates. To our chagrin we start the research a priori acknowledging that based on theories X, Y and Z, then associations A, B, and C should be observed. But when analysis fails to detect A, B, and/or C, we then proceed to assume that either (a) no relationship exists and theory X, Y and Z aren't applicable to our region (thus bad theories?), or (b) the sample size was too small.

While sample size is certainly a critical variable and one valid here, it should not be construed that a lack of significant findings means the settlement pattern was the result of random behavior. Note that samples even larger than 25% often fail to account for a significant proportion of settlement pattern variation, e.g. those described in Euler and Gummerman (1978) and Schiffer and Gummerman (1977). The more probable causes are operationalization difficulties (as discussed in SARG and here) and erroneous assumptions with regard to the archaeological spatial implications of behavior. The latter problem is considered at length by Hodder and Orton (1976). They find that many locational patterns have the form of a Poisson distribution which suggests that settlements are located as a random and independent process. This they emphasize is not so, but just the opposite.



It is known that the probability of a store locating in any area is conditional upon a number of factors, not the least important of which is the relative location of other stores. Therefore, a simple model such as the Poisson law hardly is suggested by theory, and while it may serve as a convenient first approximation of the location pattern, it reduces to simplicity a situation which already has been acknowledged as a complex one. Besides, it is almost certain that other probability models could be found which would fit the observed facts equally well, and unless there is theory to guide us in our choice, one model may appear no better than the others (King, 1969:43).

Explanation of the subsistence-settlement systems and cultural processes will certainly require substantial quantities of additional data. The quality or substantive nature of the research, however, may be more dependent upon the use of sound theoretical models without which archaeological patterned variability will never be fully understood. Given both the data and theory, then ultimately the most critical factors will probably be time and the archaeologist's persistence.



### 3.5 Topical Research and Analysis

The preceding sections have focused on the analysis of the probabilistic sample; this section addresses the nature of specific aspects of the archaeological record, including rock art, agave roasting pits, flaked lithic tools, ceramics, and obsidian hydration sample.

#### Rock Art in the McCain Valley Study Area

##### Introduction

Because of the special and fragile nature of the resource, rock art sites were made the subject of a special study as part of the McCain Valley Study Area project. Rock art comprises one of the most significant portions of the archaeological record in the McCain Valley Study Area. Within the study area, 27 rock art sites were visited and fully recorded. Of these, 17 are rock painting sites, 5 are rock painting sites with cupules present, and 5 are cupule sites; no petroglyph sites are known from the study area. In addition to the recorded sites, limited information is known for an additional 6 sites which are discussed separately below. Because of time and budget limitations, rock art sites in the region immediately surrounding the study area boundaries were not visited.

##### Recorded Sites

Rock art sites are grouped here by districts within the study area. Site numbers below were issued by the San Diego Museum of Man.

McCain Valley District: Within the McCain Valley area itself, only one rock art site has been recorded. It is, however, one of the largest and most significant of all the recorded sites, and is the only Kumeyaay rock art site on the California side of the international border for which we have ethnographic data.

C-154: A large rockshelter cave on the hillside overlooking a permanent spring and a large village area. Rock paintings are located on the ceiling and back wall of the shelter, with a few traces on rocks on the shelter floor. For recording purposes, the art has been divided into 5 panels, of which Panels 1 and 3 have the major portions of the painting. Red overpainting on Panel 1 appears relatively recent, but can reasonably be interpreted as aboriginal renewal of the painting, particularly in view of the ethnographically recorded use of the site. Alternatively, the fresher red pigment may have been applied by a photographer to emphasize the paintings. Panel 1 includes four different types of rectangular grids, a large circle with central spot, an oval grid, a sunburst, a



ladder, a herringbone element, P-shaped and T-shaped elements, and miscellaneous other abstracts, all in red, and a stylized zoomorph (?) in red and black, with a few indistinct forms, including an apparent serpent, in orange. Panel 2 includes a few abstract forms, with an L-shaped element, parallel-line form, and short straight line the most distinct; all are in orange-red. Panel 3 is an extensive series of paintings on the interior ceiling with two large, full-bodied digitate anthropomorphs in yellow which are unique to this site. Other elements include a double-tailed lizard and simple lizard, two indistinct anthropomorphs, a crosshatch grid, and miscellaneous designs in black; a complex of linear designs with circular elements in black and red; and elements in red including a two-armed cross, handprint, quartered circle, oval grid, oval, arrow, and several miscellaneous designs. Panel 4 includes a two-armed cross in black and several speckled and indistinct pigmented areas on the back wall of the shelter, while Panel 5 includes a red circle, indistinct black linear design, and various red pigmented areas on rock faces on the shelter floor. Ethnographic data on the function of this site are discussed below under "Interpretation."

Jacumba District: Rock art sites in the Jacumba district are grouped around the southern and western flank of Table Mountain. Typically, the sites are small and frequently somewhat isolated, although usually part of village or occupation areas. Many of these sites were recorded in the 1930's by Malcolm J. Rogers of the San Diego Museum of Man, who assigned the number C-128 to the entire region of boulder outcrops south of Table Mountain. His general site number has been replaced with more detailed site numbers in recent years.

C-195: Fragments of red painting (no discernible elements) on a large boulder within a very large village area with extensive milling and profuse lithic scatter. A cupule rock is located at the base of the painted face.

C-453: A rockshelter under one of many huge boulders along the base of a rocky hill, with black painting and charcoal drawing. Situated near a rather dispersed occupation area, this site shows evidence of occupation only in the presence of a small amount of bedrock milling at the shelter entrance. Design elements include a sectioned abstract design, a lizard, and a vertical chain of 2 sets of concentric diamonds. Recent visitors have added initials and over-drawing in charcoal.

C-454: This is the occupation area mentioned in connection with Site C-453. At the west edge of the site area is a small rockshelter with an H-shaped element and fragments of linear designs in red.



C-455: A tunnel-like rockshelter eroded beneath a free-standing granite boulder, with rock paintings in red along the northeast wall of the shelter. The paintings, consisting of rectilinear designs -- indistinct diamond-shaped elements, nested chevrons, diamond net pattern, herringbone, diamond crosshatch grid, vertical lines, X within an oval, and oval grid -- are unusual for this area. Occupation evidence is slight for this site, consisting primarily of a light artifact scatter which, however, includes a portable metate located at the eastern entrance to the shelter.

C-456: A large open rockshelter in the face of a boulder, walled in by three other boulders, and located within an occupation area with midden deposit. The rock face here is rapidly decomposing, and the paintings are in an advanced state of deterioration. Abstract elements in black and orange, including a spiral (the best-preserved element today), circular motifs in orange with black centers, and a series of 4 triangles are among the designs present. Malcolm Rogers left a file containing three different versions of this painting, none of which agrees fully with what is visible today. In any case, it is clear that this painting is in worse condition now than when it was first recorded.

C-457, Site 1: This is the largest of three rock painting sites located within a major village area. Many small elements here are located in wind pockets and on flat areas of the ceiling of a cave-like rockshelter formed by a large flat boulder resting on others. Elements here are mostly abstract, with the notable exception of a handprint with a central spiral design -- a common motif in the Pueblo and Fremont areas of the Southwest, but unlike other handprints in southern California. Paintings here are in various shades of red, red-orange, and red-purple, plus one smear of yellow pigment. Malcolm Rogers recorded numerous elements at this site, and again the record is at variance with what has been recorded for this survey. It appears that he may have been overly confident in interpreting element details that were not clear.

C-457, Site 2: This, the second of three sites at C-457, is a small set of paintings located in a very small rockshelter, large enough for only one man to sit upright. The granite is rapidly decomposing, and the paintings are in very poor condition. Rogers left two versions of this panel, both at variance with the modern record, but indicating that more painting was visible in the 1930's than today.

C-457, Site 3: This site, located in a rockshelter formed by a large boulder resting on others, consists of charcoal drawings on the ceiling of the shelter. Design elements include a linear H-like form, a two-armed cross, a triangle with a vertical bisecting line, and a sunburst, with traces of other lines forming no clear pattern. Rogers recorded essentially the same set of elements, apparently



interpreting the linear lines as a rectangle bisected by 2 parallel lines. It is evident that this site is in virtually the same condition as when first recorded.

C-460, Site 1: This site includes rock paintings located in a small rockshelter at the north side of a village site. The shelter is somewhat isolated in its own small arroyo, but a bedrock milling locus is located only a short distance away at the edge of the main arroyo which bounds the site on the east. Paintings here include abstract forms (elements resembling letters N, Y, and inverted V, a circle, and a rounded triangle), a simple anthropomorph, and a smeared area which appears to be a second anthropomorph, all in red.

C-460, Site 2: This site is a cupule rock located in front of a small south-facing rockshelter within a village site, with an extensive bedrock milling area extending downslope from the shelter area to the south and east. The rock art consists of approximately 17 cupules on the north side of a small boulder, facing the shelter. Between the time the site was visited for recording on 24 March 1979 and the time it was re-visited for photography on 4 July 1979, vandals had thoroughly pothunted the cave and screened the deposit, leaving behind sherds, flakes, cores, hammerstones, cobble pestles, and an oval basin metate with the back dirt.

C-461: This site consists of two adjacent rockshelters located in a very small depression or valley. Shelter A, the southernmost of the two, is hollowed out beneath a rounded boulder, and contains fragments of rectilinear black charcoal designs, including probable two-arm cross and triangle elements. Shelter B, located about 5 meters north of A, is open to the east with remnants of a rectangular walled structure enclosing the shelter. An extremely fragmentary painting in black and red is on the back wall. For both shelters, the Malcolm Rogers record is at variance with what is visible today.

Canebrake District: In 1974 and 1975, field crews representing the San Diego Museum of Man recorded an extensive series of archaeological sites in the Canebrake Wash and Inner Pasture areas, which join to form a large C-shaped valley system which includes some 8000 acres of BLM-owned grazing land, formerly leased by Bob Crawford and operated, along with a small private parcel, as the Crawford Ranch. The ranch and lease are today owned by Pete Marston, but Crawford remains in residence. Among the sites on the Crawford Ranch are 12 rock art sites.

C-156, Site 1: C-156 is the main village site in the entire Canebrake Wash-Inner Pasture valley system. This extremely large village encompasses three rock art loci, two with painting and one consisting only of cupules. Site 1 is the main set of paintings, and stands as one of the three largest and most important painting sites in the study area.



An extensive vertical series of paintings in red, red-orange, yellow, and black is located on the sloping back wall/ceiling of a large shelter located on a bench above the main village area. Design elements include skeletal forms of digitate anthropomorphs, sunbursts, a few lizard-like elements, and a wide variety of abstract forms. In general, the remaining paintings are in good condition, although an unknown number have been removed by water erosion, and a large sunburst in the eroded area is very faint. To date, this site is the only rock painting in Kumeyaay territory which contains skeletal forms. This factor, combined with its extensive nature, relatively good condition, and direct association with a largely undisturbed village, mark this site as one of major significance.

C-156, Site 2: Located on the underside of a flat boulder which rests on others to form a shelter, a second set of paintings is known for C-156. Unlike the main site, paintings here include only two abstract elements in black: an E-shaped form, and a bisected pentagon. At the west entrance of the shelter, a bedrock milling feature with a slick, oval basin, and round basin includes 4 cupules, one of which is located within the slick.

C-156, Site 3: This site consists of three cupule groups on three boulders near the edge of an arroyo in the main village area. The northernmost group consists of a single cupule at the edge of a slick; the central group includes a cupule and a small mortar; and the southernmost group has three cupules in association with a small mortar.

C-215-A: Site C-215 is an extensive linear sand dune, situated parallel to Canebrake Wash. The surface of this somewhat stabilized dune bears considerable evidence of aboriginal use, perhaps as a cremation burial site as indicated by profuse sherd scatter, burnt rock, broken metates, flaked stone, and occasional bits of burnt bone. At its east end, the dune abuts against a rocky hill, on which are a number of rock-wall room structures with associated bedrock milling and artifact scatter. This area, C-215-A, also includes an unusual cupule site, consisting of 14 cupules scattered apparently at random along the ridges of a small fractured bedrock outcrop.

C-217: A large boulder at the base of a rocky slope, with paintings on the exposed northern face of the rock and in a wind pocket shelter at the northeast end. Elements on the exposed face include a small rectilinear element and four sunbursts or possible sunbursts, all in red. Elements in the wind pocket include a badly weathered set of grid-like patterns, with superimposition, in red and black; a black digitate anthropomorph with circular torso, oriented sideways with head to the east; and fragmentary black elements.



C-220: This set of paintings is located on an open boulder face at the base of a rocky hill. Paintings include two lizard forms (one of which is separated 174 cm. to the right of the remaining paintings), an insect-like form, and various abstract elements. To the right of the main panel, at the base of the rock below the isolated lizard, is a cupule rock containing 17 badly weathered cupules and a small mortar. A single isolated cupule is located to the left of the main panel, on a rock surface adjacent to a milling slick between two large mortars.

C-221, Site 1: This site, located within a dispersed occupation area along the base of a rocky hill, consists of an open rockshelter along the western side of a large boulder. Only a trace of red pigment identifies this as a rock painting site. Below the painting is a single cupule on a rock adjacent to a slanting rock with a large slick. On a small rock in the shelter are 3 cupules associated with 2 deep mortars, while a second rock has 2 cupules with 2 small mortars.

C-221, Site 2: Site 2 at C-221 is a shallow rockshelter along the eastern side of a large boulder, with a small alcove shelter at the rear. Painting in red occurs on the ceiling of the alcove, with design elements including several concentric U motifs and an insect-like figure along with red smears. Very faint traces of red paint also occur in the main shelter above bedrock milling.

C-222: This site, located at the far (southwestern) end of Inner Pasture, includes a rock painting on the west wall of a small shelter. Design elements include a small sunburst and fragments of additional elements, with a single small digitate anthropomorph located 90 cm. to the right and 90 cm. below the sunburst. The site is a general occupation area with scant evidence of occupation at the rockshelter.

C-224: This site, known as the Indian Hut Site, was the location until sometime in the 1940's of a historic Kumeyaay thatched house. Although the site has no rock painting, one interesting cupule rock is located a short distance behind the hut site. Cupules are situated along the edge of a bedrock boulder, with 1 isolated cupule and groups of 3 and 5 cupules. Both the Indian Hut locus and the cupule rock are located within a very large village area which is nearly contiguous with C-156 on its eastern end. Also of interest at this site is the presence of a documented "fertility rock" site (McGowan, 1979). Archaeologists and others working in the granite boulder country of southern California have often noted natural geological formations in the boulders which resemble female genitalia. Ethnographic information obtained through accounts of Bob Crawford's early contacts with the Indians indicates that one of the "vulvas" on the Crawford Ranch was actually used in fertility ceremonies to promote pregnancy. The



fertility rock is located above the spring on the east side of the hill overlooking the main village area.

C-253: The area known locally as "The Caves" contains two rock art panels located close together inside the cave-like rockshelters at this site. Panel 1 is a curious pale red oval painted area with extensions upward, as if paint had been smeared in a roughly circular pattern and the fingers dragged upward in three places. A short distance to the east is a panel of charcoal drawings consisting of a rectilinear grid-like design with a sweeping arc below. The rock art is located within a general occupation area, with bedrock milling at the entrance of the shelter.

C-254: This site consists of a small village centered around a bedrock outcrop "island" in Inner Pasture. A single rock painting panel is located on the southeast side of the island at its northeast end. Only fragments of red painted designs remain, with no discernible elements. The panel is located in direct association with extensive bedrock milling and midden deposit.

Vallecito District: This district includes two recorded rock art locations, one in Vallecito Valley, south of Troutman Mountain, and one in the far southern end of Vallecito Potrero. The village location in Vallecito Valley includes two rock art sites.

C-163: This site is one of the largest village sites in the entire McCain Valley study area. Although it has not been formally surveyed, indications are that the site is very extensive, and is probably associated with other large occupation areas situated close by. At the east edge of the village area is a large granite boulder with two painted shelters and at least 190 cupules located on vertical and horizontal rock surfaces in both shelters and in front of and between the shelters. This site is the third of the three largest sites in the study area. It has suffered some vandalism, in the form of chalking and overpainting, and in the reported destruction of a large anthropomorphic painting which occurred when someone set fire to a rat's nest beneath the painting, causing extensive exfoliation (Norton Allen, personal communication). Of the remaining paintings, the panel in the shelter on the northwest side includes a large digitate anthropomorph, a "pelt" design, a centipede-like figure, a circle with interior arcs, and a bird, the last figure unique to Kumeyaay rock art. The paintings are done in black and red, with bicolor designs and superimposition (black over red). Panel 2, in a low shelter on the east side of the boulder, includes two large pointed grid-like figures, an arc with a sunburst at one end, a rectangle with two parallel zigzags, a small grid, a small handprint, a cross with a center spot, and various fragmentary designs. Colors are red, black, and yellow-orange. Much of Panel 2 has been overpainted in recent times with white paint.



C-164, Site 1: Site C-164, recorded as Garnet Peak Village by Malcolm Rogers, is actually located at the lowest tip of a ridge which tops out at Garnet Peak some 3.5 miles away in the Laguna Mountains. The village area includes two recorded rock art sites and a "missing" cupule rock. Site 1 is a single red anthropomorphic figure painted on a sheltered rock face in the south central portion of the village area.

C-164, Site 2: This site is a small boulder with 3 cupules on its upper surface, located at the south end of a bedrock mortar locus in the village area, northwest of the rock painting at Site 1. A second cupule rock, noted by Malcolm Rogers and on an earlier visit by the present author, could not be relocated.

Unrecorded Sites: In addition to the above sites, minimal data are available for 6 rock art sites which were not relocated during the present survey.

1. McCain Valley District: William Eckhardt (personal communication) reports a small red anthropomorphic figure in a rockshelter at an occupation site located on the Pepperwood Trail, overlooking Canebroke Wash. Time and budget limitations precluded efforts to record this site, which will have to be located with Eckhardt's assistance.

2. McCain Valley District: Carl Harkleroad (personal communication) reports a small rock painting site with circle and/or sunburst elements, somewhere in the upper drainage of Bow Willow Creek. A program of field exploration will be necessary to locate this site, since the informant does not recall its exact location.

3. Jacumba District: A shelter containing a ladder design in white and other unrecorded elements is reported for Site C-397, recorded during the first Table Mountain survey by the San Diego County Archaeological Society. This site was visited by the author and Melissa Johnson on 13 April 1979, but no shelter containing rock art could be located.

4. Vallecito District: A small rock painting, reportedly an anthropomorphic figure in a shelter, was reported by a field crew working on the present survey. The site was not within one of the McCain Valley study area transects, and was not recorded. Tom Banks has reported that he knows the location of the site, and it will be recorded in future fieldwork.

5. Vallecito District: A second cupule rock, with 5 cupules, at Site C-164 was noted by Malcolm Rogers in his site record, and by the present author in 1974. The rock could not be relocated on the present survey.



6. Vallecito District: In his early field notes for Site C-163, Malcolm Rogers mentions the presence of a rock art site on the crest of the Sawtooth Mountains, which separate Vallecito Potrero and Inner Pasture. There are no location data for this site.

### Style and Cultural Association

Prior to 1970, it was generally believed that all rock art in the southern part of California belonged to a single style, a rectilinear abstract style first characterized by Julian Steward (1929:22) and later discussed by D. L. True (1954). Although Malcolm Rogers and his associates had conducted research in the southern part of San Diego County and northern Baja California which clearly demonstrated the presence of different rock art, the results of his work were never published and remained hidden in the files of the Museum of Man until 1970. In that year, an analysis of file data stored at the museum (Hedges, 1970) demonstrated the existence of three clearly defined rock art styles for the southern part of the state. After initial difficulty with the problem of style names (Hedges, 1973), the southern California styles have recently been designated according to a system in which each rock art style is named after a specific type site. The three major styles of rock painting in southernmost California can be summarized as follows (Hedges, 1970, 1978).

1. San Luis Rey Style: characterized by geometric rectilinear design elements in red, including diamonds, zigzags, chevrons, straight lines, and dot patterns, often arranged in vertical series which frequently are bordered at top and/or bottom. Representational elements such as animals, anthropomorphs, handprints, and sunbursts; and curvilinear elements such as circles, concentric circles, and spirals, are present but rare (True, 1954). The style is generally associated with late prehistoric and historic Luiseno populations, with extensions into Cahuilla, Cupeno, and Diegueno territory. The type site is the major locus of style, located on the San Luis Rey River in San Diego County.

2. Rancho Bernardo Style: characterized by large-scale geometric panels in red, typically composed of maze-like patterns, fret patterns, and sets of diamond-shaped, triangular, parallel-line, or other geometric designs, applied to the exposed faces of large granite boulders. Panels are usually rectangular in shape or contained in rectangular borders. The style overlaps Northern Diegueno and Luiseno territories, with time depth unknown except for the observation that this style is older than San Luis Rey when the two occur on the same panel. The type site is the major concentration of paintings in Rancho Bernardo, San Diego County (Hedges, 1978).

3. La Rumorosa Style: characterized by defining elements including digitate and simple anthropomorphic



figures, lizards, sunbursts, various grid patterns, and circular motifs, but including a very wide variety of abstract and rare representational forms other than those itemized above. Paintings in this style are typically done in various colors in rockshelters. Based on the consistent association with late period archaeological sites, the presence of historic motifs (men on horseback, crosses) in some sites, comparisons between rock art and certain pottery designs, and the availability of ethnographic data on two sites, the style is generally associated with the late prehistoric and historic Kumeyaay population and, as presently known, is restricted to Kumeyaay territory. The type site is La Rumorosa, the largest known concentration of paintings in this style (Hedges, 1973, 1977, 1978), located in northern Baja California.

Rock art in the McCain Valley study area is assignable to the La Rumorosa Style, and there is little doubt that it was produced by the historic Kumeyaay and their immediate ancestors. All available evidence points to this association and to an unknown but probably shallow time depth, continuing into historic times.

#### Site Associations

During the course of the present survey, site association data were recorded in two major categories: plant associations, and archaeological feature/artifact associations.

For each rock art site, the dominant plant species in close proximity to the rock art site were recorded. Such data do not represent formal botanical survey, but the information does give a general indication of the plant community and the major plant types represented, with special emphasis on economically important plants. Plant association data for selected plant species are provided in Table 41.

Archaeological associations recorded for each rock art site include bedrock milling, cupules, and general artifact categories. In each case, data were noted only for the shelter itself and the immediate vicinity. Although subjectively gathered, such data are intended to provide some indication of the presence or absence of everyday living activity at rock art sites. These data, coupled with observations of whether the site is within a village or in a less intensively occupied area provide some basis for discussion of the role of rock art in aboriginal life. Archaeological association data are summarized in Table 42.

In general, the plant data are not particularly instructive, but Table 41 does give some indications of the available plant resources in the surveyed areas. If this table were expanded to include all known Kumeyaay rock art sites, both in



TABLE 41: Major Plant Associations

| Site    | Live Oak | Scrub Oak | Catclaw | Mojave Yucca | Agave | Desert Apricot | Holly-leaf Cherry | Jojoba | Cholla | Tobacco |
|---------|----------|-----------|---------|--------------|-------|----------------|-------------------|--------|--------|---------|
| C-154   | x        | x         |         |              |       | x              | x                 |        | x      |         |
| C-156/1 |          | x         | x       |              | x     | x              |                   |        | x      |         |
| C-156/2 |          | x         | x       | x            |       | x              |                   | x      | x      |         |
| C-156/3 |          | x         | x       |              | x     | x              |                   |        | x      |         |
| C-163   |          |           | x       | x            | x     | x              |                   |        | x      |         |
| C-164/1 |          |           |         |              | x     |                |                   |        | x      |         |
| C-164/2 |          |           |         |              | x     |                |                   |        | x      |         |
| C-195   |          |           | x       | x            | x     | x              |                   |        | x      |         |
| C-215-A |          |           |         |              | x     |                |                   | x      | x      |         |
| C-217   |          |           | x       |              |       | x              |                   | x      | x      |         |
| C-220   |          |           |         |              |       |                |                   |        | x      |         |
| C-221/1 |          |           |         |              |       |                |                   |        | x      | x       |
| C-221/2 |          |           |         |              |       |                |                   |        | x      | x       |
| C-222   |          |           | x       |              |       | x              |                   |        | x      | x       |
| C-224   |          |           | x       |              |       | x              |                   |        | x      |         |
| C-253   |          |           | x       |              | x     | x              |                   |        | x      |         |
| C-254   |          |           |         | x            | x     | x              |                   | x      | x      | x       |
| C-453   |          |           |         |              |       | x              | x                 |        |        |         |
| C-454   |          |           | x       | x            |       | x              |                   | x      | x      |         |
| C-455   |          |           | x       | x            |       | x              | x                 | x      | x      |         |
| C-456   |          |           | x       |              | x     | x              | x                 | x      | x      |         |
| C-457/1 |          |           | x       | x            | x     | x              | x                 | x      | x      |         |
| C-457/2 |          |           | x       | x            | x     | x              | x                 | x      | x      |         |
| C-457/3 |          |           | x       |              | x     | x              | x                 |        |        |         |
| C-460/1 |          |           |         |              |       | x              |                   |        |        |         |
| C-460/2 |          |           | x       |              | x     | x              |                   | x      |        |         |
| C-461   |          |           | x       |              |       | x              |                   | x      | x      |         |



TABLE 42: Archaeological Associations

| Site    | Rock Painting | Cupules | Rubs | Slicks | Oval Basins | Round Basins | Mortars | Sherds | Flaked Stone | Ground Stone | Village Site | Occupation Site |
|---------|---------------|---------|------|--------|-------------|--------------|---------|--------|--------------|--------------|--------------|-----------------|
| C-154   | x             |         |      | x      |             | x            |         | x      | x            |              | x            |                 |
| C-156/1 | x             |         |      | x      |             | x            | x       | x      | x            | x            | x            |                 |
| C-156/2 | x             | x       |      | x      | x           | x            |         |        |              |              | x            |                 |
| C-156/3 |               | x       |      | x      |             |              | x       |        |              |              | x            |                 |
| C-163   | x             | x       |      | x      | x           |              | x       | x      | x            | x            | x            |                 |
| C-164/1 | x             |         |      |        | x           |              |         | x      |              |              | x            |                 |
| C-164/2 |               | x       |      | x      | x           |              | x       | x      |              |              | x            |                 |
| C-195   | x             | x       |      | x      | x           | x            | x       | x      | x            | x            | x            |                 |
| C-215-A |               | x       | x    | x      |             |              | x       | x      | x            | x            |              | x               |
| C-217   | x             |         |      |        |             | x            |         |        |              |              |              | x               |
| C-220   | x             | x       |      | x      |             |              | x       | x      |              |              |              | x               |
| C-221/1 | x             | x       | x    | x      | x           | x            | x       | x      | x            | x            |              | x               |
| C-221/2 | x             |         |      | x      |             | x            |         | x      | x            |              |              | x               |
| C-222   | x             |         | x    |        |             |              |         |        |              |              |              | x               |
| C-224   |               | x       |      |        |             |              |         | x      | x            | x            | x            |                 |
| C-253   | x             |         | x    | x      |             |              | x       | x      | x            | x            |              | x               |
| C-254   | x             |         | x    | x      |             | x            | x       | x      | x            | x            |              | x               |
| C-453   | x             |         |      | x      |             |              |         |        | x            |              |              |                 |
| C-454   | x             |         |      |        |             |              |         |        | x            |              |              | x               |
| C-455   | x             |         |      |        |             |              |         | x      | x            | x            |              | x               |
| C-456   | x             |         |      |        |             |              |         | x      | x            | x            |              | x               |
| C-457/1 | x             |         |      |        |             |              |         |        |              |              | x            |                 |
| C-457/2 | x             |         |      |        |             |              |         | x      | x            | x            | x            |                 |
| C-457/3 | x             |         |      |        |             |              |         |        | x            |              | x            |                 |
| C-460/1 | x             |         |      |        |             |              |         |        |              |              | x            |                 |
| C-460/2 |               | x       |      | x      | x           | x            | x       | x      | x            | x            | x            |                 |
| C-461   | x             |         |      | x      | x           |              |         | x      | x            | x            |              | x               |



southern California and northern Baja California, then the major category of pinyon pine would have to be added, but live oak would still be noticeably absent. The data recorded here are in general agreement with previous observations that Kumeyaay rock art sites are associated with the high and low desert environments, and not with oak grove or high mountain environments (Hedges, 1977). This in turn implies a seasonal use of rock art sites in conjunction with the harvesting of major desert resources such as agave, desert apricot, or pinyon. Why the major acorn harvest is disassociated from rock art is a question which will have to be answered through further ethnographic research.

The plant association data would have greater potential for providing useful insight if similar data were recorded for all sites in the area, so that the rock art sites could be compared to other site types. As it stands, some of the associations indicated in Table 41 can be explained in general terms. Catclaw and cholla, for example, are not a major economic resource when other food plants are available, but they are nearly ubiquitous in the study area, and the table reflects this common occurrence. Scrub oak appears to reflect the high, transitional environment of the four sites with which it is associated, rather than any specific selective process. The presence at four sites of ceremonially important tobacco is an intriguing bit of data until it is noted that the sites share similar altitude and environmental situations in the same valley system -- this probably reflects the distribution of the plant rather than any selection process, but the possibility nonetheless remains that tobacco could occur at the painted shelters through human action, since it was planted by the Kumeyaay. One aspect of the plant data which should be further examined is the nearly universal presence of desert apricot -- of the entire group of sites, this plant is absent from only 6 rock art sites located at only 4 archaeological site areas. Examination of location data shows that these 4 sites are situated in dry areas where apricot would not be expected to occur. It is here suggested that desert apricot, which has previously been little recognized as a major economic resource, may have been an important reason for the location of habitation, and consequently ceremonial, rites.

The archaeological associations of rock painting sites show some interesting patterns. For purposes of discussion, those sites which have only cupules are discussed separately below. Of the remaining 22 sites, it can be seen from Table 2 that the three sites identified as major sites with significantly greater amounts of painting (C-154, C-156 Site 1, and C-163) are associated with village sites. In the case of C-154 and C-156 Site 1, the painted shelters contain bedrock milling, artifacts, and (not shown on the table) midden, and are situated overlooking extensive village sites, while C-163 is located directly in a village area with extensive bedrock



milling, black midden deposit, and dense artifact scatter. This suggests that these sites were major community ceremonial sites, and that the paintings must not have been particularly sacrosanct, since they are visible from a distance. These same areas, however, could have been temporarily closed off with brush shelters during important ceremonies.

The smaller sites are all associated with bedrock milling except for a cluster of 7 sites in the Jacumba area. Five of the smaller sites, distributed through the Canebrake and Jacumba samples, have no immediate artifact associations, but in each of these cases the paintings are in sites or portions of sites which were not intensively occupied, and the absence of artifacts at any one time of observation could reflect several circumstances, including erosional downwash which effectively covers artifacts in the Canebrake district. The distribution of small sites throughout village and occupation areas might suggest individual family use, especially since the rock art often appears at what seem to be resource extraction camps, and each small site appears to be the work of one artist at one time. The possibility that the sites may be shaman's retreats, vision quest locations, power spots, or other personal sacred places appears to be ruled out by the presence of everyday activity as evidenced by bedrock milling.

The occurrence of 7 small rock art sites without bedrock milling activity in the Jacumba district constitutes evidence of a local pattern which does not appear to exist elsewhere in the sample of recorded sites. Six of the seven sites are part of or peripheral to the large village complex at C-457, while the seventh (C-454) is located a short distance to the west. The reason for this unusual and restricted distribution is not clear from available data, but the absence of bedrock milling suggests that these sites were restricted from everyday living activities, and were somehow reserved for special use. Of the 7 sites, only C-457 Site 1 shows evidence of cumulative use over time, suggesting recurring use of this site, most likely in connection with rituals to benefit the community. Aside from slight superimposition by a fresher element at C-457 Site 2, each of the remaining sites appears to have been the work of a single artist at a single time, perhaps suggesting that the place was of special importance to an individual (shaman?) during his lifetime or for a shorter period. With the scant ethnographic data, all such suggestions remain speculative. General interpretive hypotheses have been offered for Kumeyaay rock art, and are discussed below.

### Interpretation

In general, American Indian rock art has been shown to be of ritual and sacred significance (Wellmann, 1979). Kumeyaay rock art appears to be no exception, and the difficulties of acquiring the raw materials and making the paint in themselves



would indicate that rock painting was not undertaken for frivolous reasons. The interpretation of the art itself, and of particular sites, is no easy task.

Rock art in the La Rumorosa Style can be plausibly interpreted in general terms as shamanistic and ritual art. A number of specific design elements and motifs have general shamistic implications in American Indian art, and these elements appear in Kumeyaay art as well. Examples include the high frequency of sun motifs, wavy lines or other extensions from the head which indicate supernatural power or sacred status, certain animal motifs such as birds and mountain lions, and, as exemplified by the major site at C-156, skeletal anthropomorphs which echo a concern with the human skeleton and shamanistic rebirth, which is a common shamanistic motif. Under this interpretation, most Kumeyaay rock art would seem to have been produced by shamans. While on the basis of available data we cannot possibly provide exact interpretations for the rock art, we can still make suggestions.

In any culture, the shaman is the individual who has the special ability to contact and interact with the supernatural world. Generally he does this for the benefit of his community -- to increase game, bring about the abundance of plant foods, control weather, foster human fertility, cure illness, and the like. Contact with the supernatural may occur through visions, dreams, and trances which occur naturally, or are produced by fasting or hallucinogenic substances (Hedges, 1976). Such activities may result, as they have in many cultures, in art which illustrates mythological themes, the shaman's experiences, beings and forces he encounters in the supernatural realm, animals from which he derives supernatural power, or the shaman himself as he performs his magical duties. Shamanistic performances and art may be connected with a wide variety of ceremonies, both public and private.

For the Kumeyaay, the association of rock art with ceremonial activity is confirmed by two ethnographic accounts, the second of which demonstrates an association between the rock art and shamans.

In 1975, Pedro Santo, a resident of Tecate, Baja California, told (personal communication) of an account obtained originally from Maria Paipa, a Kumeyaay from the community of San Jose de Tecate. Maria related the story that a rock painting near San Jose, which remains today, has a ceremony connected with it, and that the animal in the painting is a coyote. The account is frustratingly vague, but it does provide the association of rock art with ceremonial activity.

The second account is more specific, and concerns site C-154 in the McCain Valley region. In the late 1920's, Malcolm Rogers obtained an account of this site from Wass Hilmawa, his Kumeyaay informant from the Manzanita Reservation



in San Diego County. Wass said that the paintings in the cave at C-154 were made by shamans when they prepared themselves for ritual dances. We do not know if she actually observed the practice, or simply related that which had been passed down to her, but her further statement that the paintings were made for amusement, in the light of other evidence, does not appear to be correct. It may be that Wass, as a female, was relating information on a subject, male shamanism, with which she was not totally familiar, or that knowledge of the real reason for the painting had been lost with the passage of time. In any case, this account provides firm evidence for the association of rock painting not only with ceremonial activity, but specifically with shamans (Hedges, 1970:78-81).

Among the design elements in the rock art of the McCain Valley study area, three in particular have possible shamanistic implications. The first of these is the sun motif, which recurs at numerous sites. The sun is the source of life and power, and his return from his southward journey was encouraged by ceremonies at the time of winter solstice (Hedges, 1979). As the source of life and power, the sun was one of the supernatural beings which the shaman had to influence, and the occurrence of the sun motif in shamanistic art is widespread (Vastokas and Vastokas, 1973:55-65). It is also possible that sites with the sun motif had some connection with solar ceremonies, such as those held at winter solstice, but specific involvement with solar phenomena such as illumination of a rock face or identification of a sun-watcher's observatory has not been demonstrated for rock art sites in the study area. Rock art sites with winter solstice associations are known for the Kumeyaay site of La Rumorosa in northern Baja California, and for aboriginal sites elsewhere in California (Hudson, Lee, and Hedges, 1979).

The bird motif at Site C-163 Panel 1 is a second possible shamanistic motif. Birds are symbols of supernatural flight and serve as shamans' familiars, providing access to the other world and giving special powers to the shaman. The bird at Vallecito Potrero (C-163) may have specific shamanistic implications, since birds figure importantly in Kumeyaay shamanism (Spier, 1923).

Finally, the skeletal figures at Canebrake Wash (C-154 Site 1) are reminiscent of skeletal themes and motifs throughout aboriginal Siberian and North American shamanism. The bones are viewed as the essential source of life force, and it is from the bones that the shaman is regenerated after his mythological death and dismemberment in the supernatural world. This theme has not been specifically identified for the Kumeyaay, and the presence of the skeletal motif must remain as a tantalizing indication of all that we do not know (Hedges, 1976).



The possible functions of the rock art sites themselves have been alluded to in the preceding section. The large ceremonial sites, with evidence of repeated use and major panels of rock painting, are perhaps most plausibly viewed as community sites, where major ceremonies were held for the benefit of all members of the society. This suggestion has been made for the main rock art site at La Rumorosa, the type site for the style. The La Rumorosa sites are located in the pinyon zone, where large numbers of people from widespread localities gathered in the fall to harvest pinyon nuts. In this context, I have suggested that the central main site may have functioned as a community ceremonial center for this composite group of people at a time when abundant food supplies allowed for the celebration of major ceremonies with large gatherings of people. The smaller sites could then function as individual family or clan sites, where groups from diverse areas could conduct rituals on a smaller scale, producing individualized rock art (Hedges, 1977). This interpretation is applicable to the present project only in part, in that sites in the McCain Valley Study Area are not seasonal centers where people from diverse areas congregated, as far as we know. The major sites, however, still appear to be large community ceremonial centers, while the smaller rock art locations seem to call for a more personalized function. The suggestion that small, relatively isolated sites may have been shamans' retreats, power spots, or something similar can be neither confirmed nor denied on the basis of present evidence.

In summary, rock art is a very significant part of the archaeological record in that it provides one of our rare glimpses into the sacred, non-material world of the aboriginal inhabitants. Rock art sites are tangible links to the supernatural world, and although we cannot fully interpret them, their sacred status renders them doubly significant in any preservation and management decisions. To the best of our present knowledge, the production of rock art was a sacred, shamanistic activity, undertaken in ritual context for the benefit of the people who lived at the sites.

#### Cupule Sites

The use of the term "cupule" to refer to small, mortar-like pits which occur on rock surfaces either singly or in groups has recently come into general use. This form of rock art has generally been referred to in the literature as "pit-and-groove" petroglyphs, with the general acknowledgement that grooves are absent from many sites. On a worldwide basis, as evidenced by a cup-marked stone from La Ferrassie in France, this form of rock art is the earliest known, dating from Mousterian times, ca. 70,000-30,000 B.C. (Haddingham, 1979: 56-58). As Haddingham has observed, "the cup mark appears over and over again as the basic element in the rock art



created by primitive communities of farmers as well as hunters throughout the ages, for whom the symbol undoubtedly concealed countless different meanings" (1979:58).

Occurrences and possible functions of cupule petroglyphs in southern California have been summarized by Minor (1975), whose conclusions remain valid in the absence of any detailed study of the phenomena included under this term. As Minor points out, suggested functions for cupules include human fertility as exemplified in the "baby rocks" of northern California, weather control as recorded for "rain rocks" in the same part of the state, hunting magic as suggested for the Great Basin, boundary markers as possibly implied in Luiseno ethnography, and some undefined role in initiation ceremonies as recorded also for the Luiseno (1975:2, 15-17). None of these explanations applies, except by implication, to the Kumeyaay, for whom there are no ethnographic data on the function of cupules.

Even in the small sample as the ten sites with recorded cupules in the McCain Valley Study Area, there is a bewildering variety of occurrences:

1. Cupules occur with rock paintings at C-156 Site 2, C-163, C-195, C-220, and C-221 Site 1.
2. Cupules occur by themselves at C-156 Site 3, C-164 Site 2, C-215-A, C-224, and C-460 Site 2.
3. Cupules occur on the top surfaces of small boulders in association with bedrock mortars or basins at C-163, C-220, and C-221 Site 1.
4. Cupules occur on flat bedrock surfaces in association with milling and often incorporated into slick surfaces at C-156 Site 2, C-156 Site 3, C-163, and C-195.
5. Cupules occur on boulders without bedrock milling at C-163, C-164 Site 2, C-215-A, C-221 Site 1, C-224, and C-460 Site 2.
6. Cupules occur in extensive random groups on vertical rock faces at C-163.

While some of the occurrences in association with bedrock milling could represent a practical food preparation function for cupules, many of the sites clearly do not lend themselves to such an explanation, and it is probable that some ritual function is indicated. In recent cupule studies, possible alignments to celestial events and the interpretation of cupule patterns as representations of constellations have been suggested (Travis Hudson, John Romani, personal communications), and at least two sites in Kumeyaay territory (neither in the study area) may lend themselves to this interpretation. In



short, cupule studies are in their infancy, and a systematic analysis of the varieties of occurrence and site associations appears called for as a first step.

### Site Preservation and Management

As a fragile and rare class of cultural resource, rock art sites require particular attention in the development of management plans. In general, although they generate high interest on the part of the general public, rock art sites are especially vulnerable to vandalism, both intentional and unintended. As a result, it has frequently been found that restriction of site location data is often an effective, though partial, means of preservation. Where sites are opened to public visitation, there is inevitably an increase in destruction through vandalism.

The major rock painting site at C-154, for which we have one of the rare ethnographic statements regarding rock art, is not presently located on BLM land. Acquisition of the site by land exchange or other means, and inclusion of the site in an area with wilderness designation would do much to protect this important site from increased access.

In general, the remote location of the rock art sites and the fact that most of the smaller sites are not obvious to the casual visitor have served to protect rock art resources in the McCain study area. Control of access has also been an important factor, particularly on the Crawford Ranch, where the conscientious stewardship provided for over 40 years by Bob Crawford has aided in the preservation of sites on the ranch.

This is not the case everywhere, as exemplified by site C-163 in Vallecito Potrero, well known and readily accessible via a ranch road, which has suffered greatly from ruinous overpainting, and from the reported destruction of a major design element by fire. In the Table Mountain area, increased public access from the nearby freeway has resulted in spray paint vandalism in areas formerly considered remote, and in the willful destruction of archaeological resources by pot-hunters.

Whether restricted access and public education can solve these problems remains to be seen, but it appears advisable to leave closed those areas which are currently inaccessible, and to incorporate sensitive areas, such as C-154, into zones of restricted access where a variety of concerns, such as preservation of bighorn sheep habitat and protection of archaeological resource can be addressed. In no case should an archaeological resource be publicized to the extent that its location is revealed.



## ROASTING PITS

Approximately 45% of sites within the sample, and a roughly equivalent proportion of previously recorded sites, are earth oven features believed to be agave roasting pits. Because these constitute the most numerous features within the region, their morphological characteristics and spatial and environmental distribution are briefly discussed.

### Ethnographic References

The most important plant processed in roasting pits was agave (Agave spp.). Agave was a staple of the Cahuilla and other groups living in the Lower Sonoran Life Zone (Bean and Saubel, 1972:31; Shipek, 1970:32). Aschmann (1959:79) believes that the availability of agave actually set an upper limit on population in the Central Desert of Baja California.

Two parts of the agave were roasted. Leaves were cut and roasted at almost any time of the year. Agave stalks were cut and roasted in the spring or summer when they contained the most sugar (Bean and Saubel, 1972:31). Roasted agave stalks were pounded and stored for later consumption or trade.

Aschmann (1959:64-65), Barrows (1900), Chase (1919:63), and Shipek (1970:57) provide information on the construction of agave roasting pits. An interesting series of photographs of agave preparation is in Bean and Saubel (1972:168-169). A pit about 2 to 3 feet deep and nearly twice as wide was excavated and lined with rocks. Sometimes a large rock was placed in the center to help distribute the heat (Bean and Saubel, 1972:34). Next a fire was built in the pit and allowed to burn down to coals. The Cahuilla preferred to use chamise and ribbon wood (Adenostoma spp.) (Bean and Saubel, 1972:30). Then agave leaves and stalks were either laid directly on the coals or on rocks placed on the coals and covered with earth, leaves or grass (Bean and Saubel, 1972:34; Chase, 1919:63). The cooking process lasted from 1 to 3 days (Bean and Saubel, 1972:34; Chase, 1919:63). Both gathering and processing agave were male tasks (Bean and Saubel, 1972:34; Shipek, 1970:57).

Several other food items were cooked in roasting pits by the Cahuilla. Yucca and nolina stalks were baked in pits similar to those used to roast agave (Bean and Saubel, 1972:94, 150). Other foods cooked in rock-lined pits, probably of a smaller size, are lily bulbs, cactus buds, bladderpods and mesquite blossoms (Bean and Saubel, 1972:50, 68, 77, 79, 95, 108).

### Analysis

One hundred and fifty-nine roasting pits, located on 116 sites, were recorded during the field survey. Several other ashy areas that could have been roasting pits were also noted.



These features usually appear as a roughly circular configuration of medium sized granitic rocks with ash and charcoal concentrated within the circle, but often spread for a distance beyond the stones. A large center stone was noted in a few of the pits.

It took only a short time in the field to discern that roasting pits were located in situations where few other site types occur. They were found on the steep slopes of mountains around desert valley areas. Although very important, activities associated with roasting pits were short term and did not require a lengthy stay in the immediate vicinity of the pits.

Not unexpectedly, roasting pits are located only in those environments where agave occurs (Table 43). Of the nine roasting pit sites without agave on the site, six have yucca. Reexamination of the other sites would probably reveal either agave or yucca located fairly close to the site.

Roasting pit sites are concentrated in the Enriched Desert Scrub community (Table 44). There are significantly fewer roasting pit sites in the Chaparral and Desert Chaparral communities, areas where the density of agave is low.

Roasting pit sites occur mostly in the mountain stratum (Table 45). There are significantly fewer roasting pits in the mountain valleys and desert valleys. Agave is absent in the mountain valleys and is less abundant on the desert valley flats. It is possible that roasting pits located in the valleys have been eroded or buried.

Roasting pits were located on moderate to steep slopes (mean - 33%) (Table 46), often on small benches on canyon or ridge slopes. There is a significant paucity of roasting pits on the flats (0-10% slope). Again, there is a possibility that erosion or deposition has created this situation.

Roasting pits are not associated with flowing water (Table 47) and are further from streams than most other sites (Table 48).

The occupants of this physiographically transitional area had more dependable water resources than the groups in the Central Desert of Baja California, described by Aschmann (1959: 79), who carried uncooked agave stalks back to their base camps, near water, for processing. The evidence in the study area is that agave stalks were usually roasted in the vicinity of the agave plants and then brought down to camps in the valleys for consumption or further processing. In some cases, the distance between the roasting pits and the camps was probably not far.



The cultural associations of roasting pits are fairly easy to describe since 88% occur as isolates or with other roasting pits. Most of the remaining roasting pit sites occur with only a few sherds, flakes, or rubs, and only three larger sites have roasting pits in association. This is different from the roasting pit sites in Bow Willow recorded by Wallace and Taylor (1958:Table 1), most of which occur with a wide range of other artifacts. A number of factors may contribute to this difference, including collecting/pothunting, site recordation techniques, and environmental and cultural variability.

### Future Research

Because roasting pits are so visible and abundant, they could be the focus of a number of interesting research problems. For ease of discussion, these are divided into problems of formal, spatial and temporal variability.

#### Formal

Of obvious functional interest is variability in size. While it was found impractical in this survey to measure every roasting pit, a range of pit sizes was noted. Ethnographic information suggests that large and small pits are related to different roasting activities. While pit size can usually be measured from surface indications, it is most likely that this measure will be more informative when combined with data obtained from excavation.

Depth, construction methods, and content are other aspects of pit form that are of importance. All of these require at least partial excavation for data collection. Although three roasting pits have been excavated in the McCain Valley Study Area -- one in Bow Willow by Wallace and Taylor (1958), one in Canebrake by Ken Hedges (personal communication), and one in Table Mountain by Ron May (personal communication) -- at present there are no detailed analyses of the contents of these pits. Studies of the charcoal from the Table Mountain excavation are planned (Ron May, personal communication). Analysis of pit contents is of particular interest because it may provide information on the types of fuel used and the items roasted.

The types of fuel used to heat the roasting pit is of interest because many of the pits are located away from good wood sources. One would predict that local wood sources were used, since it would make little sense to carry wood to the roasting pit areas when the roasted stalks have to be carried down anyway. Presence of charcoal from non-local wood species in a roasting pit would better suggest vegetation change than long-distance fuel procurement.



While it is unlikely that whole agave stalks remain in roasting pits awaiting discovery by archaeologists, it is possible that there are charred fragments of stalks, pods, leaves, bulbs or other plant parts in many pits. Although it is likely that most roasting pits are associated with agave procurement, this assumption should be subject to considerably more examination than it has been. A column of soil from a sample of roasting pits should answer this and other questions about roasting pit construction and use.

### Spatial

Some of the spatial aspects of roasting pits have already been discussed. The overall pattern of roasting pits in respect to current vegetation and other macro-spatial variables would be of considerable interest and could be obtained without much fieldwork. Because roasting pits are fairly large and have quantities of charcoal and ash on the surface, most of them should be visible on aerial photographs taken with light or heat sensitive infrared film. Roasting pits should reflect less light and radiate more heat than the surrounding terrain. An initial test program of aerial photography (some of which may already be available) and field checking would be necessary to determine the best film, time of day for photography, scale and sources of error. Once developed, this technique would make it possible to study the distribution of roasting pits without costly field work. Also, from such a study, particular roasting pits or areas could be selected for more intensive field studies.

From the same photographs, it may be possible to plot the approximate distribution of agave. Roasting pits found outside these areas (a rarity according to this study) may indicate that vegetation change has occurred or that items other than agave may have been roasted. Propositions generated from this work can be tested in a small-scale field project.

### Temporal

Lack of any temporal control for roasting pits greatly reduces the number and variety of research problems that can be approached with these sites. At present, there are little solid data to contradict the assumption that all roasting pits were used at the same time.

A possible, but crude, means of temporally seriating roasting pits would be to determine the amount of ash and charcoal remaining. Presumably older pits would have less organic materials than more recent ones, although various cultural and environmental factors may reduce the usefulness of this relationship.

A more accurate, but more expensive, method of dating roasting pits would be radiocarbon dating. Most roasting pits



have plenty of charcoal for dating purposes. If a series of roasting pits were dated, it would be possible to see if use of agave changed through the late prehistoric period and whether all agave areas were exploited during the same periods. Unfortunately, since most roasting pits are isolates, dating them will help little in the dating and study of other cultural elements. Such a dating program may fall into the category of something that would be nice to do but that is impractical at this time.



TABLE 43

Presence/Absence of Roasting Pits by Presence/Absence of Agave

|       |         | Roasting Pits |        |
|-------|---------|---------------|--------|
|       |         | Present       | Absent |
| Agave | Present | 107           | 47     |
|       | Absent  | 9             | 91     |

$$\chi^2 = 89.38$$

$$\phi^2 = 0.35$$

$$p = 0.001$$

TABLE 44

Presence/Absence of Roasting Pits by Vegetation Community

|                       |  | Roasting Pits |        |
|-----------------------|--|---------------|--------|
|                       |  | Present       | Absent |
| Chaparral             |  | 2             | 24     |
| Desert Chaparral      |  | 7             | 37     |
| Enriched Desert Scrub |  | 94            | 69     |
| Creosote Bush         |  | 13            | 8      |

$$\chi^2 = 42.6$$

$$p = 0.001$$

$$\text{without chaparral } \chi^2 = 25.5$$

$$p = 0.001$$



TABLE 45

## Presence/Absence of Roasting Pits by Landform

| Stratum         | Roasting Pits |        |
|-----------------|---------------|--------|
|                 | Present       | Absent |
| Mountain        | 101           | 48     |
| Mountain Valley | 0             | 53     |
| Canyon          | 2             | 6      |
| Desert Valley   | 13            | 31     |

$$\chi^2 = 79.8$$

$$p = 0.001$$

$$\text{without Mountain Valley } \chi^2 = 24.3$$

$$p = 0.001$$

TABLE 46

## Presence/Absence of Roasting Pits by Slope

| Slope  | Roasting Pits |        |
|--------|---------------|--------|
|        | Present       | Absent |
| 0-10%  | 20            | 52     |
| 11-30% | 45            | 55     |
| 31-50% | 30            | 22     |
| 50+ %  | 21            | 9      |

$$\chi^2 = 17.3$$

$$p = 0.001$$



TABLE 47

Presence/Absence of Roasting Pits by Presence/Absence of Water  
Roasting Pits

|               |         | Present | Absent |
|---------------|---------|---------|--------|
| Flowing Water | Present | 0       | 22     |
|               | Absent  | 116     | 116    |

$$\chi^2 = 20.1$$

$$\phi^2 = 0.08$$

$$p = 0.001$$

TABLE 48

Mean Distance to Rank II Streams for Roasting Pits  
versus non-Roasting Pit Sites

| Mean Distance to<br>Rank II or Higher Stream<br>(km) | Roasting Pits | Non-Roasting Pit Sites |
|------------------------------------------------------|---------------|------------------------|
| Vallecito-Canebrake<br>Mountain                      | .6315         | .5100                  |
| Desert Valley                                        |               |                        |
| McCain<br>Mountain                                   | .6957         | .7667                  |
| Mountain Valley                                      | -*            | .9857                  |
| Table Mountain<br>Mountain                           | .8000         | .7478                  |

\*No roasting pits in McCain Mountain Valley



## COLLECTIONS RESEARCH

During the field survey, ceramic and flaked lithic artifacts, including obsidian waste flakes, were collected to allow more specialized analysis. A collection of ceramics was taken for detailed classification by Ronald V. May to assess the range of types occurring at larger sites within the sample region. Flaked lithic tools, mainly projectile points, were also collected for type classification. The obsidian samples were collected and submitted for hydration analysis to establish the temporal range of occupation and to assess the feasibility of applying this methodology to the region for dating phases of occupations. The results of the analyses of ceramics and flaked lithics/obsidian are presented in the following sections, which also include summaries of the characteristics of each component within the sample.

### Ceramic Component

Ceramics were present at ninety-four sites, including camps, scatters, groundstone or milling features, roasting pits, and rockshelters. Two basic classes were noted: Tizon Brown Ware and Desert Buff Ware. The former are considered indigenous to the Peninsular Range area, constructed from residual clay sources; and the latter from the desert valleys east to the Colorado River, with wash, river, and lake bed sedimentary clay deposits as the paste sources (Rogers, 1936; May, 1978). Both classes were present within all of the southern portions of the sampled area (Vallecito-Canebrake, McCain Valley, Table Mountain); three groups were detected: brown wares with coarse inclusions in paste/temper, buff wares with comparably coarse inclusions, and buff wares with fine, sandy temper/paste inclusions, probably representing mountain, desert transition, and desert source areas respectively.

The introduction of ceramics is dated at about 1000 B.P. (May, 1974; True, 1966). Only weak chronological distinctions can yet be drawn on the basis of pottery types within the ceramic sequence because the types occur throughout the area, with overlapping geographic and cultural distributions. This is true of this sample, in which both plain brown wares indigenous to the mountains and buff wares of the Colorado Desert are represented. This may be explained as readily by proposing admixtures of peoples and movement across the desert as by chronological sequences of occupation.

Wilke (1976) has proposed that significant fluctuation in late prehistoric (ceramic) occupations within the region were based upon intensive exploitation and successive abandonment following desiccation of Lake Cahuilla. He postulates an increase in the occupation of areas such as the eastern slopes of the Laguna Mountains occurred following desiccation of the



lake (A.D. 1500). This would explain in part the relatively high density of ceramic sites and the mixture of styles and source materials in the area. But the lack of chronological control over ceramic type frequencies precludes any confirmation of this hypothesis using the present survey data.

Temporal divisions within the ceramic phase are not yet documented on the basis of type frequency distributions. Emphasis, rather, is placed on scaling geographic distributions for types distinguished by color, paste/temper variations and minor vagaries in firing technique. Malcolm Rogers recorded some late ethnographic notes on ceramic production techniques in south McCain Valley (Rogers, 1936), which suggest that functional requirements may have contributed as much to clay source selection as cultural-territorial traditions, and that styles and decoration may have been bound by family or lineage ties. Clay sources were not owned, and different sources were exploited depending upon the intended use of the vessel. Rogers notes that a source in Mason Valley was valued for cooking wares by potters in the Jacumba region, due to the micaceous content of the clay. Tom Lucas (Cline, 1979:43) recalls four white (buff?) clay sources within the study area, at Campo, Warner's Springs, San Felipe Valley, and Laguna Meadow that were prized by Mt. Laguna-Vallecito groups for the color and fineness of the clays, which required little reduction or processing for use.

Although regionally a type-frequency/distance-to-clay source model may explain gross variability, the ceramic industry in this subregion is quite complex, and variability is introduced by geographical, functional, and cultural traditions within the resident group, as well as trade and immigration from the eastern desert areas.

Table 49 lists the distribution of ceramic densities and types recorded within the sample. The ceramic classes 1-5 are exponential intervals estimated from average density x site size. As the density estimates were not systematically recovered, the exponential interval was used as a rank order approximation for analysis. The Brown Ware/Buf Ware dichotomy is presented in lieu of more specific type information for most sites.

The greater rates of ceramic deposition are associated with temporary camps, in conjunction with flakes and milling. Neither large sherd scatters nor whole pots were found within the sample. Buff wares are found as potdrops and isolates, as well as at larger sites. Of fourteen camps with ceramic densities of  $10^4$  or larger, 70% had buff wares noted within the component, while they were observed at only 40% of the remaining twenty-one smaller camps. The distribution is regionally focused, as 13 of 18 camps with buff wares are in desert valley or mountain strata of Vallecito-Canebrake, or in desert



transitional canyons.

Samples of ceramic types present at larger sites were collected for more specific classification by Ronald V. May. May's classifications (May, 1977, 1978; cf. Dobyns and Euler, 1958; Rogers, 1936) are based upon differences in color, firing, and paste/temper composition and inclusions, and are structured around ware, series, and type divisions which have general areal distributions.

This detailed classification is presented in Table 50 with a regional breakdown of the range of types in Table 51. A greater diversity of types are located within the desert transitional valleys (Vallecito-Canebrake) than in McCain Valley or Table Mountain (Jacumba); Buff Wares also are more frequent in these areas. While controls over the relative frequency of types was not possible with this sample, some brief interpretive comments based upon qualitative occurrence of types were provided by the analyst, Ronald V. May.

Colorado Red, Colorado Buff, Tumco Buff, and Parker Buff are definitely trade items. Mohave and Yuma people probably are responsible, as their trade in the eastern Colorado Desert is well documented. Salton Buff, Ocotillo Buff, and Salton Brown seem to be associated with Lake Cahuilla. I would roughly place this material in Rogers' Yuman II (950-1500 A.D.); later adjusted by Wilke.

The Carrizo Buff is a very interesting type. It was originally defined from samples found in Coyote Canyon in the Santa Rosa Mountains and Carrizo Canyon north of Table Mountain. The design elements are nearly identical to Mohave designs (Parker Red-on-Buff). I believe that Carrizo Buff is an early Yuman III development which resulted in Lake Cahuilla populations leaving the low desert and taking residence along major trade routes to the better watered mountain.

The brown ware types are less distinct. Most Tizon Brown Ware is San Diego Brown, which means no tradition in the manufacture. It is not time or area distinct. I feel that certain area traditions developed as clan territories were developed. Hence, Sentenac Brown was made by ancestral Litc Kumeyaay people who lived between Warner's Pass and the Vallecito Mountains. Hakum Brown is a type of the eastern slopes, primarily in the Oriflamme, Sawtooth, and In-Ko-Pah area. Pine Valley Gray and Pine Valley Red are very late Yuman III types associated with high mountain Kumeyaay in the Laguna Mountains. Both types are distinguished by reduction-atmosphere firing and a unique paste composition. Palomar Brown follows the same hypothetical argument, but it is made in the Palomar-Buck-Aguanga-Agua Tibia area.



TABLE 49

## Distribution of Ceramics--All Stages

| Site Types                                | CERAMIC CLASS INTERVAL |                       |                       |                       |                       |          |             |              |               |   | % BUFF WARE |    |  | Total Sites |
|-------------------------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------|-------------|--------------|---------------|---|-------------|----|--|-------------|
|                                           | <u>10<sup>1</sup></u>  | <u>10<sup>2</sup></u> | <u>10<sup>3</sup></u> | <u>10<sup>4</sup></u> | <u>10<sup>5</sup></u> | <u>0</u> | <u>1-20</u> | <u>21-80</u> | <u>21-100</u> |   |             |    |  |             |
| Temporary Camp                            | 02                     | 6                     | 5                     | 10                    | 11                    | 3        | 14          | 16           | 4             | 2 |             | 35 |  |             |
| Large Sherd<br>Lithic Scatter             | 03                     | 1                     | 1                     | 1                     | 4                     |          | 5           | 1            |               |   |             | 6  |  |             |
| Small Sherd<br>Lithic Scatter             | 04                     | 3                     | 4                     | 3                     |                       |          | 7           | 1            | 1             | 1 |             | 10 |  |             |
| Groundstone-<br>Sherds                    | 09                     | 4                     |                       |                       |                       | 4        |             |              |               |   |             | 4  |  |             |
| Sherd Scatter                             | 12                     |                       | 4                     | 2                     |                       | 4        |             | 1            | 1             |   |             | 6  |  |             |
| Isolated Sherd                            | 13                     | 25                    |                       |                       |                       |          |             |              |               |   |             | 25 |  |             |
| Roasting Pit with<br>Rubs and/or Sherds   | 15                     | 4                     |                       |                       |                       | 3        |             |              |               | 1 |             | 4  |  |             |
| Rockshelter with<br>Sherds-Lithic-Milling | 16                     | 1                     | 1                     |                       |                       | 2        |             | 1            |               |   |             | 2  |  |             |
| Rockshelter with<br>Ceremonial Function   | 18                     | 2                     |                       |                       |                       | 2        |             |              |               |   |             | 2  |  |             |
| TOTALS                                    | 46                     | 14                    | 16                    | 15                    | 3                     | 41       | 20          | 6            |               | 3 |             |    |  |             |



TABLE 50

## Ceramics Collections Results

Vallecito-Potrero

SDi-5056 (203-4:1)  
Salton Brown (white slip)  
Hakum Brown

SDi-6874 (315-1:2)  
San Diego Brown  
Hakum Brown  
Salton Buff  
Carrizo Buff

SDi-6873 (313-1:4)  
San Diego Brown  
Colorado Red  
Carrizo Stucco

SDi-6889 (113-1:1)  
Hakum Brown  
Salton Brown  
Sentenac Brown  
San Felipe Brown (possibly Cocopa)  
Pine Valley Red  
Carrizo Buff (Roger's Group II:  
Yuman III)

North McCain Valley

SDi-5058 (214-1:1)  
San Diego Brown  
Pine Valley Gray  
Hakum Brown  
Carrizo Buff

SDi-6887 (126-2:A)  
San Diego Brown  
Hakum Brown  
Vallecitos Buff  
Tumco Buff

SDi-6885 (133-1:1)  
Hakum Brown  
Sentenac Brown  
Carrizo Buff  
Vallecitos Buff

Walker Canyon

SDi-5036 (321-3:1)  
Ocotillo Buff  
(This is the first appearance of pigment on this type, so without more specimens to distinguish this occurrence as a "type" from an anomaly I can only provisionally call it a type. The type is quite unusual and only known heretofore from Ocotillo Wells along the San Felipe River and about two miles from the 1500 A.D. shore of Lake Cahuilla. See Figure 7.4-1.

Canebrake Wash

SDi-1305 (209-1:1)  
Carrizo Buff  
Ocotillo Buff  
Vallecitos Buff  
Tumco Buff  
Parker Buff (south variant)

SDi-5237 (208-1:1)  
San Diego Brown  
Palomar Brown  
Hakum Brown  
Salton Brown  
Carrizo Buff  
Parker Buff  
Colorado Buff

SDi-2532 (211-2:3)  
San Diego Brown  
Carrizo Buff  
Vallecitos Buff

SDi-6888 (119-1:2)  
Salton Brown  
Carrizo Buff (Roger's Group II)

South McCain Valley

SDi-5060 (223-2:2)  
San Diego Brown  
Carrizo Buff

Table Mountain

SDi-5063 (228-3:1)  
San Diego Brown  
Ocotillo Buff  
Carrizo Buff  
(One of the Carrizo Buff sherds has a most unusual rim, suggesting a slight flare at the lip on a narrow-mouthed jar of not too great a height. It also has a hole drilled near the lip, which might have been for a handle.)

SDi-4338 (228-1:1)  
San Diego Brown

SDi-5037 (144-4:1)  
San Diego Brown  
Hakum Brown  
Salton Brown  
Pine Valley Gray

SDi-6891 (142-4:1)  
San Diego Brown  
Sentenac Brown  
Pine Valley Gray  
Salton Brown  
Hakum Brown  
Coachella Brown  
Tumco Buff



TABLE 51

Range of Types of Ceramics by Sample Region

|                                                   | <u>Vallecito-Canebrake</u> | <u>McCain Valley</u> | <u>Table Mountain</u> |
|---------------------------------------------------|----------------------------|----------------------|-----------------------|
| BROWN WARE:                                       |                            |                      |                       |
| San Diego                                         | 5                          | 4                    | 4                     |
| Palomar                                           | 1                          | 0                    | 0                     |
| Hakum                                             | 5                          | 3                    | 2                     |
| Sentenac                                          | 1                          | 1                    | 2                     |
| San Felipe                                        | 1                          | 0                    | 0                     |
| Salton                                            | 3                          | 0                    | 2                     |
| Pine Valley Grey                                  | 0                          | 1                    | 2                     |
| Pine Valley Red                                   | 0                          | 0                    | 0                     |
| BUFF WARE:                                        |                            |                      |                       |
| Carrizo                                           | 6                          | 0                    | 1                     |
| Colorado                                          | 1                          | 0                    | 0                     |
| Parker                                            | 2                          | 0                    | 0                     |
| Ocotillo                                          | 1                          | 0                    | 1                     |
| Salton                                            | 2                          | 0                    | 0                     |
| Tumco                                             | 1                          | 1                    | 1                     |
| Vallecitos                                        | 2                          | 2                    | 0                     |
| MISCELLANEOUS:                                    |                            |                      |                       |
| Carrizo Stucco                                    | 1                          | 0                    | 0                     |
| Ocotillo Black-on-Buff                            | 0                          | 1                    | 0                     |
| Colorado Red                                      | 1                          | 0                    | 0                     |
| Number of Sites<br>with Collections<br>All Type 2 | 7                          | 5                    | 4                     |



More controlled sampling of a range of sites from all areas will be needed to rank the relative contribution of temporal, traditional and functional factors to the observed variability in ceramic type frequency distributions. Serial correlation analysis of ceramic frequency distributions may provide a directional "sequence" that can be tested against site (and artifact) variability, regional distribution, or independently derived dates to assess which dimension best explains the sequence. This will require both surface and subsurface samples, some of which are independently dated, and is probably beyond the scope of a single project. The potential value to future research is considerable, however, and it is recommended that systematic, statistically representative samples be collected whenever possible as a research priority.

### Flaked Lithic Component

Flaked lithic tools and waste materials were recorded at seventy-three sites and as sixteen isolated occurrences, together comprising 35% of the total sample. The predominant materials present were locally occurring quartzes, volcanics, and metavolcanics from the Jacumba Mountains, especially the Table Mountain formation. Obsidian was also noted at sixteen sites and sample collections at thirteen of these were submitted for hydration analysis. Other stylistically or morphologically distinct artifact forms were also collected in hopes of estimating temporal and functional parameters for various sites and site types.

The most striking feature of the distribution is the lack of morphologically distinct artifacts for most sites within the sample. The predominant forms were cores, core tools, flake or core based scrapers, and utilized flakes. These were most frequently noted at larger, more complex sites. No sites were recorded that had a sufficient sample from which to assess temporal or functional variability from surface inspection.

Several processes may be responsible for the observed distribution. Curation of specialized forms at transient camps or processing areas is likely, with infrequent discard of whole specimens at smaller sites. A separate, and apparently significant, factor is the undocumented and uncontrolled collection of artifacts by local residents and visitors. Many of the sites in the area are well known to collectors, and looting has apparently occurred for some time. Wallace noted this type of disturbance during his early reconnaissance of the Bow Willow drainage (1958). May has conducted limited testing at Table Mountain and notes a dramatic increase in the recovery of forms at subsurface levels, which is probably due to surface impacts from collection (May, personal communication).

The lack of diagnostic forms seriously limits temporal and formal ordering of sites within the sample, consequently



waste densities are used. While material compositions were not systematically estimated, most sites exhibited a variety of materials of local and exotic sources, supporting an inference of late occupational phases. The frequent occurrence of isolates and small scatters of local source materials suggests an opportunistic and ad hoc tradition of tool manufacture emphasizing immediate, task specific production of flakes or cobbles rather than emphasizing investment in producing stylistically or functionally distinct forms adaptable to a range of uses.

The few stylistically diagnostic forms collected are described below, followed by a discussion of hydration analysis, an additional experiment conducted to develop temporal ordering of the sites sampled.

### Projectile Points

Only five projectile points were found in the approximately 7000 acres surveyed; this is a density of slightly under one point per two square miles. This low density is surprising, but can be attributed to the work of pothunters and casual collectors. All five points are of the basic small triangular form with straight to concave bases indicative of late prehistoric occupations. Data on the points are given in Table 52.

Two points (126-2-13 and 128-2-1) are unnotched, triangular, with concave bases. Both are made on curved flakes with some of the original flake surface remaining. Neither are bifacially retouched on all edges. This is True's Type 1 (1966:97), or Cottonwood Triangular, the most common late prehistoric point in the region. It dates from before A.D. 1300 to the historic period.

Two other points (126-2-11 and 135-1D-1) are concave base triangular points with side notches. Point 135-1D-1 has a clear impact fracture. These points are True's Type 5 (1966:100-102), or Desert Side Notch, common in the late prehistoric period of inland southern California. Bettinger and Taylor (1974:26) date this type after A.D. 1300 in southern California, although it may occur somewhat earlier in the Great Basin.

The final point (209-1-1) is an unusual triangular obsidian point with wide (3-4 mm) and deep (2 mm) serrations. The tip of the point is broken by an impact fracture. Although it was cut twice for hydration measurement, no hydration band was visible.

Future work in the area should involve collecting of all projectile points encountered and studying as many points as possible in the possession of area collectors, museums, and residents. Obsidian points should be subjected to hydration analysis if at all possible. A projectile point typology/



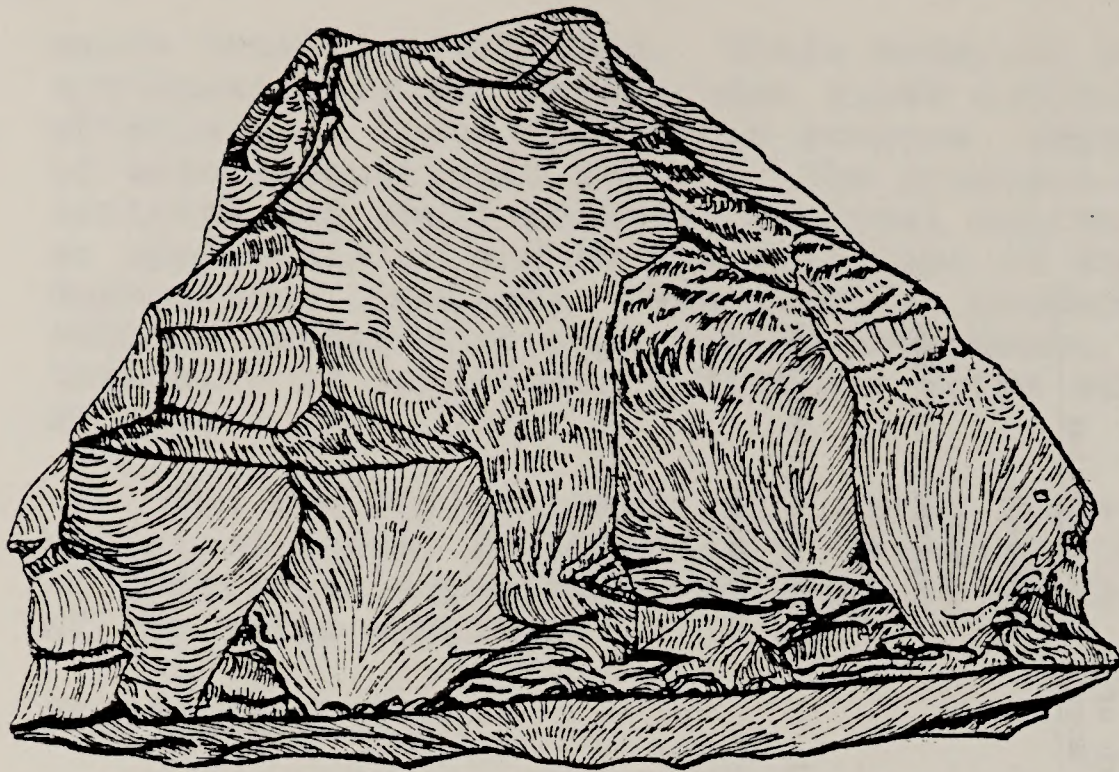
TABLE 52

## Projectile Point Data

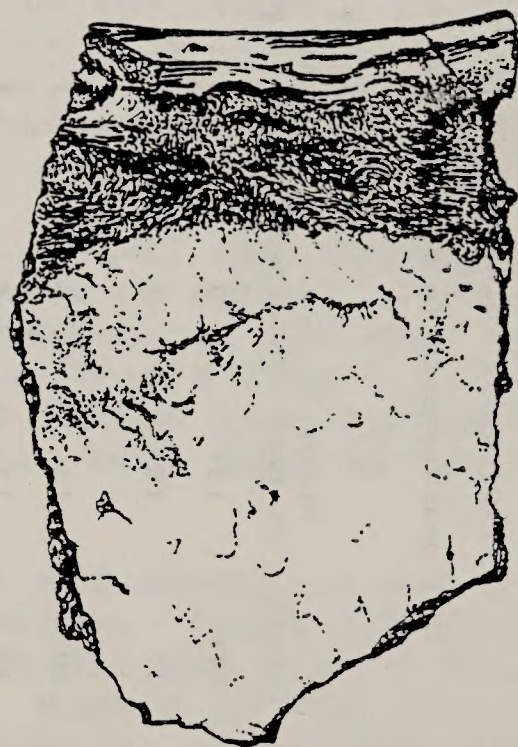
(All measurements in millimeters)

| ASM<br>Site No. | SDSU<br>Site No. | Artifact<br>No. | Length | Width<br>of Base | Thickness | Depth of<br>Basal<br>Concavity | Depth of<br>Side Notch | Material                    |
|-----------------|------------------|-----------------|--------|------------------|-----------|--------------------------------|------------------------|-----------------------------|
| 126-2           | SDi-6887         | 11              | 11+    | 13+              | 3         | 0                              | -                      | Obsidian                    |
| 126-2           | SDi-6887         | 13              | 32     | 15               | 7         | 1                              | -                      | Banded<br>cryptocrystalline |
| 128-2           | SDi-6892         | 1               | 20     | 13               | 3         | 1                              | -                      | Basalt                      |
| 135-1D          | SDi-5036         | 1               | 22     | 12               | 4         | 1                              | 2                      | Cryptocrystalline           |
| 209-1           | SDi-1305         | 1               | -      | 16               | 3+        | 3                              | 2-3                    | Obsidian                    |





SCRAPER  
SDi 5062



OCOTILLO BLACK-ON-BUFF  
SDi 5063



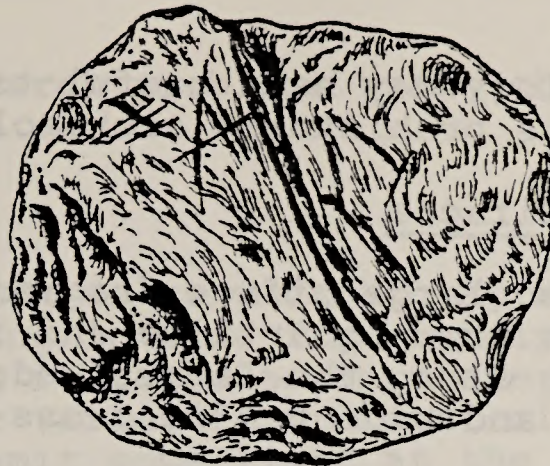
PROJECTILE POINT  
SDi 6887

SCALE 1:1

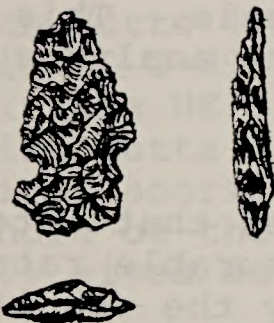
Artifact Illustrations

FIGURE 13



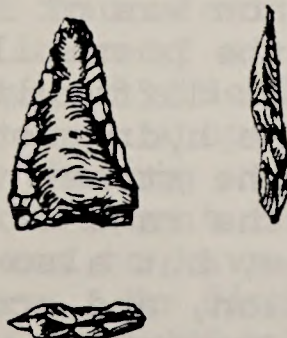


SHAFT STRAIGHTENER  
SDi 6872



BLADE  
SDi 5060

PROJECTILE POINT  
SDi 5036



SCALE 1:1

PROJECTILE POINT  
SDi 6905

Artifact Illustrations

FIGURE 14



chronology may be a useful tool for organizing and comparing the late prehistoric archaeology of the area.

#### Other Bifaces

Two large biface fragments were collected. 223-2-3 is reddish brown quartzite and is finely finished by percussion flaking along the lateral edges. It is 39 mm wide, 12 mm thick, and biconvex in cross-section.

The second example (227-2A-1), composed of milky quartz, is only crudely shaped by percussion flaking. It is 57 mm long (incomplete), 32 mm wide, and 15 mm thick. It is plano-convex in cross-section.

Both artifacts appear to have been broken in the process of manufacture. They were probably preforms for knives or large projectile points.

#### Obsidian Hydration Analysis

As an initial step toward more accurate dating of prehistoric occupation in the McCain Valley Study Area, a number of obsidian samples were collected and submitted to the UCLA Obsidian Hydration Laboratory for hydration measurements. While the size of the sample is quite small, it is adequate to assess some of the problems and potentialities of applying the technique to the area on a larger scale. This section summarizes the methods and results of the analysis.

#### Technique

In the late 1950's it was discovered that water is absorbed into volcanic glasses at a measurable rate. This process, called hydration, is apparently the result of diffusion and reaction of water with obsidian (Ericson, 1975).

This phenomenon was of immediate interest to archaeologists because of the possibility of using it to date obsidian artifacts. Initial difficulties were encountered when it was discovered that the hydration rate (the rate at which water is absorbed into the stone) varies between regions and between obsidian types. The rate of hydration was found to be not just a function of time, but also a function of temperature, chemical composition, and occasionally soil chemistry and exposure to solar radiation (Michels and Bebrich, 1971:178-182).

While these problems slowed down use of the technique for a while, they have now been reduced to the point where obsidian hydration is often being used for dating and seriation. The work by Ericson (1977, 1979) on California obsidian sources and their hydration rates took much of the guesswork out of the



technique and a wide range of research problems using obsidian hydration can now be considered.

### Characterization of the Obsidian

The obsidian collected is black to very dark gray with white crystalline inclusions varying in size from barely visible to 4 mm. The inclusions are often rectangular in shape and appear to be quartz. The material varies from almost clear to opaque, although most pieces transmit some light at the edges. On translucent pieces the interior sometimes has a granular texture or, rarely, banding. The cortex, when present, is matte black.

In most cases, the inclusions are not abundant enough to affect the cleanness of the fracture. However, a couple of pieces exhibit poor conchoidal-fracture because of inclusions or other flaws.

This material appears similar to that from Obsidian Butte in Imperial County (Banks, 1971; Long and May, 1970:38), and it is likely that this was the main source of most obsidian found in the McCain Valley region. Chemical characterization of Obsidian Butte material and comparison with a sample of obsidian from an archaeological context is necessary before this association can be stated with confidence.

Obsidian Butte (recorded in the San Diego Museum files as Obsidian Island, C-89) is located at the south side of the Salton Sea in the NE 1/4 of Section 32, Township 11 S, Range 13 E (Obsidian Butte 7.5 Quadrangle). It is a small volcanic dome of pumice, scoria, and obsidian rising about 100 feet above the shore of the Salton Sea (Morton, 1977). Malcolm Rogers (n.d.) gives details on the obsidian outcrops:

Large obsidian veins present as intrusives into pumice and intermediate varieties. The largest vein has a maximum breadth of four feet but is of poor quality. A parallel vein of an average width of 12 inches lying on south side is of best quality. Several small work shops are located on a north terrace. The big work shop is on the south side on two different terrace levels. Most of the work seems to have been of a test and roughing out nature. No finished artifacts were found . . . (from handwritten notebook in San Diego Museum of Man files).

The top of the Butte is 130 feet above sea level and the San Diego Museum of Man records imply that the obsidian veins are between 145 and 160 feet below sea level while a level of obsidian cobbles used extensively as a quarry is at the base of the Butte.



Obsidian Butte is only 20-25 miles from sites in the McCain Valley Study Area and is much closer than any other known obsidian source. The only other obsidian source that might be relevant to the area is one reported 50 miles south of San Felipe, Baja California (Banks, 1971), a distance of 190-230 miles from the study area. The obsidian from this source is described as being far superior to that from Obsidian Butte, although it still has inclusions (Banks, 1971:25).

#### Methods of Hydration Measurement

Water begins diffusing into obsidian immediately after a fresh surface is exposed by fracturing. The depth of water penetration into an obsidian piece can be seen under a microscope as a band or rim along the edge of the piece. The width of this band is used to estimate the date when the piece was last fractured.

To obtain a hydration measurement from an obsidian artifact, a piece 2 mm wide and 3 mm deep is cut from one of the edges with a diamond saw. This piece is then ground flat and affixed to a microscope slide for viewing (Michels and Bebrich, 1973:202-208).

For this sample, measurements of the hydration band were made at five different points on each face of the edge of the artifact. These measurements, which usually do not vary significantly, were averaged to obtain a single measurement for each face. These two values varied only slightly from face to face. They were then averaged to obtain a single value for the artifact. Measurements were given to the nearest 0.1 micron and all have a  $\pm 0.2$  error factor.

In some cases no hydration band was visible or the band was hazy, making measurement difficult. A band may not be visible because it is too thin to be measurable (bands less than 0.1 micron are not generally measurable) or for a variety of other reasons (see Michels and Bebrich, 1971:209). Hazy bands were measured, but these measurements are not used when calculating the mean hydration width for an artifact.

Table 53 lists obsidian hydration measurements obtained from McCain Valley samples. The measurement of each face and the mean or best measurement (used in cases where one of the measurements was hazy or not visible) are given. Three artifacts were cut on two separate edges to determine if there were major differences in the hydration band width on the same artifact, perhaps indicating artifact reuse. The difference between these values was extremely small.

The hydration measurements in this sample tend to be thin, ranging from 1.0 micron to 5.4 microns. A measurement of 12.8 microns was obtained on the face of one flake, but this is a cortex measurement and predates human use of the material.



TABLE 53

## OBSIDIAN HYDRATION MEASUREMENTS

| Site No. | Artifact No. | Hydration Measurement (in microns) |         |              |
|----------|--------------|------------------------------------|---------|--------------|
|          |              | Face 1                             | Face 2  | Mean or Best |
| SDi-6889 | 1            | nhv                                | 2.5     | 2.5          |
| SDi-6889 | 2            | 4.3                                | 4.4     | 4.4          |
| SDi-6889 | 3            | 4.4                                | 4.1 (h) | 4.4          |
| SDi-6890 | 1            | 3.8                                | 4.1     | 4.0          |
| SDi-6887 | 2            | 3.0                                | 2.7     | 2.8          |
| SDi-6887 | 3            | 2.3                                | 2.3     | 2.3          |
| SDi-6887 | 4            | nhv                                | 2.6 (h) | 2.6          |
| SDi-6887 | 5            | 2.7                                | 3.2     | 3.2          |
| SDi-6887 | 6            | 3.3                                | nhv     | 3.3          |
| SDi-6887 | 7            | 3.2                                | 3.3 (h) | 3.2          |
| SDi-6887 | 8            | 1.2                                | 1.5     | 1.4          |
| SDi-6887 | 9            | nhv                                | nhv     | -            |
| SDi-6887 | 10           | 3.6                                | nhv     | 3.6          |
| SDi-6887 | 11           | nhv                                | nhv     | -            |
| SDi-6887 | 12           | 1.2                                | nhv     | 1.2          |
| SDi-6887 | 14           | 2.8                                | 3.1     | 3.0          |
| SDi-6887 | 16           | 1.5                                | 1.5     | 1.5          |
| SDi-6886 | 1            | 3.8                                | 4.1     | 4.0          |
| SDi-6884 | 1            | 3.2                                | 2.7     | 3.0          |
| SDi-5037 | 1            | 2.1                                | 2.1     | 2.1          |
| SDi-5037 | 2            | 1.1                                | 1.0     | 1.0          |
| SDi-1305 | 1            | 2.6                                | 2.2     | 2.4          |
| SDi-1305 | 2 (cut 1)    | 2.5                                | nhv     | 2.5          |
| SDi-1305 | 2 (cut 2)    | 2.3                                | 2.1     | 2.2          |
| SDi-1305 | 3            | nhv                                | 1.4     | 1.4          |
| SDi-1305 | 4            | 4.4                                | 4.2     | 4.3          |
| SDi-1305 | 5 (cut 1)    | nhv                                | 1.2     | 1.2          |
| SDi-1305 | 5 (cut 2)    | 1.2                                | nhv     | 1.2          |
| SDi-1305 | 6            | 3.8                                | 3.7 (h) | 3.8          |
| SDi-1305 | 7            | 2.1                                | 2.0     | 2.0          |
| SDi-1305 | 8            | 2.7 (h)                            | 2.8     | 2.8          |
| SDi-1305 | 9            | 1.8                                | 1.1 (h) | 1.8          |
| SDi-1305 | 10           | 5.4                                | 5.3     | 5.4          |
| SDi-1305 | 11           | 2.8                                | 3.0     | 2.9          |
| SDi-1305 | 12           | 1.4                                | 1.2     | 1.3          |
| SDi-1305 | 13           | 1.8                                | 1.8     | 1.8          |
| SDi-1305 | 14           | 3.2                                | 3.1     | 3.2          |
| SDi-1305 | 15           | 2.3                                | nhv     | 2.3          |
| SDi-1305 | 16           | 2.1                                | 2.1     | 2.1          |
| SDi-2532 | 1 (cut 1)    | 2.7                                | nhv     | 2.7          |
| SDi-2532 | 1 (cut 2)    | 12.8*                              | 2.8     | 12.8*/2.8    |
| SDi-2532 | 1            | 2.0                                | 2.1     | 2.0          |
| SDi-2532 | 1            | 2.7                                | nhv     | 2.7          |
| SDi-5059 | 1            | nhv                                | 2.6     | 2.6          |
| SDi-1003 | 1            | 3.1                                | 3.4     | 3.2          |

h = hazy hydration band, not averaged with other measurement  
nhv = no hydration visible

\* dates cortex, not culturally significant



## Dating

A curve converting hydration measurements to absolute dates is established by obtaining a series of associated C14 dates and obsidian hydration measurements from obsidian of a known source (Michels and Bebrich, 1971:183-186). At this time, there are only two such associations for the Obsidian Butte source and although a preliminary curve has been published (Ericson, 1975: Figure 8), it is not intended for chronometric purposes. However, the curve is within the range of curves for other California obsidian sources and so we can use the rates calculated for these better known sources to gain some idea of the approximate time span represented by the McCain Valley samples.

A number of different models have been proposed for the obsidian hydration process. Ericson (1979) has tested these various models for goodness of fit to known data, and concluded that the standard diffusion law model is best in most cases. The model reads:

$$T = dx^2,$$

where T is the number of years the sample has been exposed to hydration, d is the source specific diffusion coefficient, and X is the hydration band width in microns.

Ericson (1979:Table 1) also gives the diffusion coefficients for twelve different obsidian sources in California and Nevada. Using the mean and extremes of these coefficients, it is possible to compute a range of dates corresponding to various band widths. This is done in Table 54.

At the fastest California hydration rate, a 1.0 micron hydration band would represent only 35 years, while at the slowest rate the same band width would represent 436 years. The fast rate is close to a rate proposed by Chace (1969) for obsidian found in Orange County -- 5.7 microns in 1000 years which is  $d = 30.8$ . Unfortunately, the source of this obsidian is not known.

## Distribution of Obsidian

The location of transects where obsidian was collected and observed is shown in Table 55, as well as the quantities observed. Because of the limited time that could be spent at sites, it is unlikely that all the obsidian present on the surface of any given site was seen. Obsidian is difficult to see if the sun is at a bad angle or the flakes are very small. Flakes under 5 mm can be cut for dating so it is important that a site be scoured carefully for very small pieces.



TABLE 54

Absolute dates (T) for various hydration band widths (X) at various diffusion rates (d), where  $T = dx^2$  (computed from Ericson 1979: Table 1).

|                         | X     | 1.0     | 2.0  | 3.0  | 4.0  | 5.4   |
|-------------------------|-------|---------|------|------|------|-------|
| d                       |       |         |      |      |      |       |
| Fastest California Rate | 35.0  | T = 35  | 140  | 315  | 560  | 1021  |
| Average California Rate | 160.6 | T = 161 | 642  | 1445 | 2570 | 4683  |
| Slowest California Rate | 436.3 | T = 436 | 1745 | 3927 | 6981 | 12723 |

TABLE 55

## List of Transects with Obsidian Collected/Observed

| <u>Location</u> | <u>No. of Obsidian<br/>Pieces Collected</u> | <u>More Obsidian<br/>Observed?</u> |
|-----------------|---------------------------------------------|------------------------------------|
| Potrero         | 4                                           | -                                  |
| North McCain    | 13                                          | +                                  |
| South McCain    | 1                                           | -                                  |
| South McCain    | 1                                           | -                                  |
| Table Mountain  | 2                                           | -                                  |
| Canebrake Wash  | 16                                          | +                                  |
| Canebrake Wash  | 3                                           | -                                  |
| North McCain    | 1                                           | -                                  |
| Vallecitos      | 1*                                          | -                                  |
| Potrero         | 1                                           | -                                  |
| Walker Canyon   | 0                                           | +                                  |

\*not dated



Over 85% of the obsidian collected in the region was located within a circle of four miles radius that includes the upper McCain Valley, Canebrake, and lower Vallecito Valleys. No obsidian was observed in the four northern areas (San Ysidro Mountain, San Felipe Hills, Banner-Julian, Oriflamme) and only a few pieces were found in the lower McCain Valley and Table Mountain areas. The lack of obsidian in the northern areas is probably due to the terrain surveyed, as obsidian is fairly common on sites in the San Felipe Valley (Long and May, 1970: Table 3). In contrast, the low frequency of obsidian in the southern areas may be culturally meaningful, since all environmental areas were sampled. It is possible that the Table Mountain lithic sources were used instead of obsidian, although a detailed analysis of tool types and lithic types would be necessary to determine this.

There are no ethnographic references that specifically refer to trade of Obsidian Butte obsidian. The Cahuilla are reported to have traded obsidian to the Gabrieleno (Bean, 1978:582), but there is no specific information on where this obsidian came from (cf. Bean, 1972:124). No trade connections are reported between the Cahuilla and the desert Kamia, who probably controlled Obsidian Butte, or the mountain Kumeyaay (Southern Diegueno), who conducted considerable trade with the desert groups (Davis, 1961).

The desert Tipai and mountain Kumeyaay had close social and economic bonds. They visited one another to trade, although it was more common for the mountain groups to visit the desert villages (Gifford, 1931:17, 23). They brought such products as acorns, baked agave stalks, and yucca fiber and fiber products in exchange for agricultural products (Davis, 1961:20; Gifford, 1931:17, 23). Presumably obsidian was traded as well, although the lack of ethnographic information on this is curious. It may be that archaeological evidence is all that remains to document this trading process.

Figure 15 is a frequency distribution of the 42 hydration measurements from McCain Valley. The sample is too small to allow any interpretation of the peaks and gaps in the curve. Michels and Bebrich (1971:200) discuss the problem of sample size as it relates to obtaining a satisfactory obsidian use curve for a site. They suggest that a sample of 100 pieces is needed to yield a satisfactory curve for a site with a complex history, while 5 to 10 samples is adequate for interpreting specific features or areas within a site. Thus, this sample from the McCain Valley region is useful for only very low level inferences and hypothesis generation.

The smallest hydration reading in the McCain Valley sample is 1.0 and there are two others at 1.2. If these samples represent obsidian use towards the end of such activities in the area, then they probably date to the middle of the 19th



FIGURE 15

Frequency distribution of obsidian hydration measurements for the McCain Valley sample. N = 42

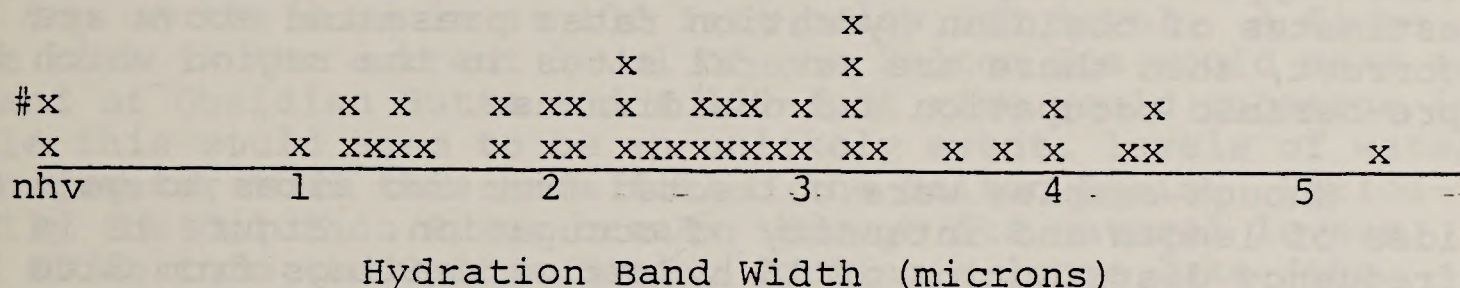


FIGURE 16

Frequency distribution of obsidian hydration measurements from Site 209-1 (SDi-1305)

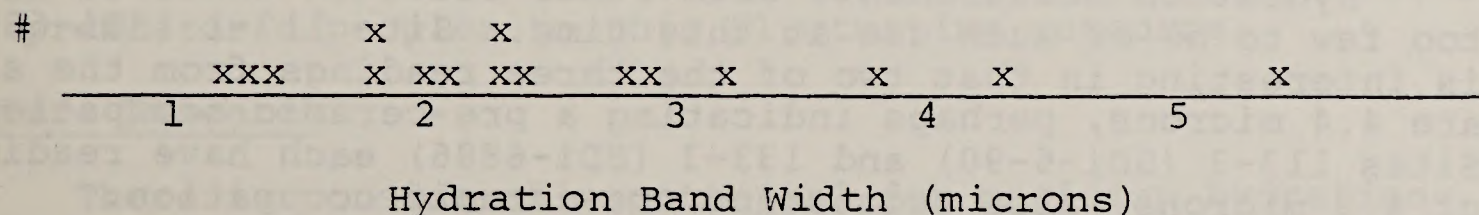
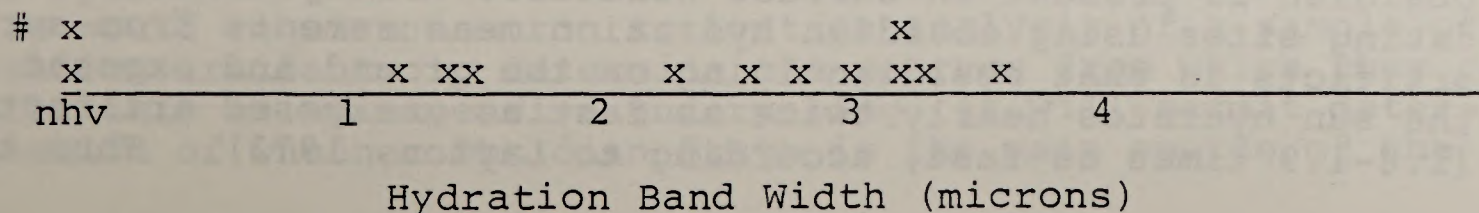


FIGURE 17

Frequency distribution of Obsidian hydration measurements from Site 126-2 (SDi-6887)





century when Indian populations in the area were declining rapidly (see Lawton, 1976). Thus, a hydration band width of 1.0 should date to about 100 years B.P., which represents a diffusion rate somewhere between the fastest and the average California rate (cf. Table 2). If this is the approximate range of the rate, then the widest band measured, 5.4 microns, would date around 3000 years B.P.

All sites from which obsidian was collected had ceramics and lacked evidence of pre-ceramic occupation, which by itself would suggest that obsidian was used only in the ceramic period (i.e. approximately the last 1000 years). However, if the estimates of obsidian hydration rates presented above are correct, then there are several sites in the region which had pre-ceramic occupation and obsidian use.

Enough samples were collected from two sites to gain some idea of length and intensity of occupation. Figure 16 is the frequency distribution of 16 hydration readings from Site 209-1 (SDi-1305), a large campsite located on a sand dune above Canebrake Wash. The readings suggest a fairly lengthy occupation span for this site, 2000 years or more. The distribution of readings does not allow determination of whether the site was abandoned for any length of time.

Figure 17 is the frequency distribution of 13 hydration readings from Site 126-2 (SDi-6887), a large campsite located in the In-Ko-Pah Mountains near the headwaters of Bow Willow Creek. The range of readings is a little narrower than the Site 209-1, but a lengthy period of occupation is still indicated. The gap between 1.5 and 2.3 microns may indicate a hiatus in occupation (or, at least, obsidian use) at this site.

Hydration measurements from other sites in the area are too few to be of much use at this time. Site 113-1 (SDi-6889) is interesting in that two of the three readings from the site are 4.4 microns, perhaps indicating a pre-ceramic occupation. Sites 113-3 (SDi-6-90) and 133-3 (SDi-6886) each have readings of 4.0 microns, also suggesting pre-ceramic occupation.

When larger samples of hydration measurements are obtained from sites in the area, it should be possible to seriate sites and to begin to examine questions about cultural change. For example, a site with readings clustering around 2.0 microns is younger than one with readings clustering around 4.0 microns, assuming that the obsidian is from the same source. Such a method of ordering sites has only been done in a few areas (Layton, 1973; Russell, 1979), but it has great potential where obsidian is present in surface scatters. One problem with dating sites using obsidian hydration measurements from surface artifacts is that obsidian lying on the ground and exposed to the sun hydrates nearly twice as fast as unexposed artifacts (1.8-1.9 times as fast, according to Layton, 1973). Thus the



hydration rate of excavated artifacts in the McCain Valley area may be considerably slower than that estimated here for surface artifacts. However, since most work would probably be with surface collected materials, this problem is not as great as it seems.

#### Temporal Availability of Obsidian Butte Obsidian

An interesting facet to the problem of trade of Obsidian Butte obsidian is that the Butte was under water for extended periods in the past, and thus unavailable for use (Banks, 1971). The top of the dome is at 130 feet below sea level. A five-foot rise in the current level of the Salton Sea would make an island of Obsidian Butte and a 100-foot rise would submerge it. While this would seem to be an unlikely event, levels of water even greater than this have filled the Salton Basin. Periodically the Colorado River breaks through its natural levees and flows into the Salton Basin, forming a large lake (the current lake, the Salton Sea, was formed as the result of an engineering accident in the early 1900's). Between approximately A.D. 1000 and 1400 the entire Salton Basin was filled by a body of water called Lake Cahuilla (also called Lake LeConte or the Blake Sea). The maximum equilibrium stand of Lake Cahuilla was between 40 and 45 feet above sea level (Barnard, 1968:104; Weide, 1976a:12; Wilke and Lawton, 1975:11). Thus, Obsidian Butte was under 170-175 feet of water for at least 300 years. In an earlier flooding event, about A.D. 400, the Butte was under water to about the same depth (Weide, 1976b:95).

The hydrological history of the Salton Basin is quite complex (Hubbs et al., 1960, 1963, 1965), but an understanding of it is critical to an understanding of the temporal distribution of use of Obsidian Butte obsidian and to the adaptations of prehistoric peoples to this fluctuating resource.

#### Future Research

There is considerable potential for obsidian hydration research in the McCain Valley Study Area. There is enough obsidian on archaeological sites that a program of obsidian hydration, combined with research on ceramics and other artifacts, should result in important contributions to our understanding of exchange and adaption. Outlined below are some major research problems that should be pursued in the region in the future.

Needed first is basic research on the chemical profiles and hydration characteristics of the obsidian used in the area. This would require neutron activation analysis of a sample of obsidian artifacts to determine the sources from which they came. While this is an expensive undertaking, it will permit determination of whether Obsidian Butte is the main source of the



McCain Valley obsidian, as appears likely, or whether other sources are involved. If other sources have contributed a significant amount of material, then some means would have to be developed to separate them so that meaningful hydration analysis could be conducted.

As some control is gained over the source of the material, steps can be taken to obtain more accurate estimates of the diffusion rate(s) of the obsidian. Because surface and buried obsidian hydrate at different rates, two rates would be calculated for each source. Direct estimate of the diffusion rate for surface obsidian will be difficult, because surface artifacts are usually not unambiguously associated with other datable artifacts or features. Cross-dating with projectile points or ceramics may be possible in some cases.

The diffusion rate for subsurface obsidian can be approximated by obtaining a number of C14 dates associated with obsidian. The rate obtained by this method can be used as an upper limit on the rate for surface artifacts.

A program of obsidian sourcing and dating in the McCain Valley Study Area will provide a basis for a wide variety of research problems, some of which are discussed elsewhere in this report. A research problem specifically related to obsidian is that of exchange between desert and mountain groups. Obsidian is particularly good for studying trade in the Southern California area because of its restricted occurrence and fluctuating availability.

If Obsidian Butte was the primary source of obsidian in the San Diego County area, and all available evidence suggests it was, then obsidian from this source must have been unpredictable because of flooding in the Salton Basin. A radiocarbon dating program to determine the history of Lake Cahuilla was completed in the 1960's and provides a basis for estimating major water level fluctuations in the area in the last 2000 years (Hubbs et al., 1965). However, the hydrological history of the basin is complex and further research will be needed to date short-term floodings that may have affected the accessibility of Obsidian Butte.

During the periods that the water level in the Salton Basin was above 130 feet below sea level, Obsidian Butte obsidian was unavailable to prehistoric populations. During these periods, we would not expect to find Obsidian Butte obsidian in archaeological contexts (cf. Banks, 1971:26). This prediction can be tested by obtaining a large (200+ pieces) sample of dated obsidian artifacts known to have come from Obsidian Butte. Gaps should exist for the hydration band widths representing the period A.D. 1000-1400 and any other periods when Obsidian Butte was submerged. Because of the problems discussed earlier, the present McCain Valley obsidian sample is inadequate to test this proposition.



During periods of high water, populations using Obsidian Butte obsidian could adapt in a number of ways. Three possibilities are presented below in the form of hypotheses.

Hypothesis 1 - If Obsidian Butte obsidian became unavailable due to flooding, then the populations relying upon this obsidian source would increase their use of other fine grain non-obsidian materials.

To test this hypothesis, it would be necessary to isolate those sites or site areas used when Obsidian Butte was unavailable and demonstrate a significant difference in lithic materials used in these areas as compared to areas occupied when obsidian was available. Because of the problem of multi-component sites (the obsidian hydration data suggest that many or most of the large sites were occupied for extended periods) and the inability to date non-obsidian materials, this hypothesis is essentially untestable at this time.

Hypothesis 2 - If Obsidian Butte obsidian became unavailable due to flooding, then the populations relying upon this obsidian would increase their use of obsidian from other sources.

A change in obsidian use would be observable by the presence and abundance of non-Obsidian Butte obsidian during periods when Obsidian Butte was under water. Testing of this proposition would require sourcing of artifacts and construction of a hydration rate for the exotic materials present.

If obsidian were not simply a good lithic material but also had some social or religious significance, one would expect obsidian from other sources to be traded for immediately after the loss of the Obsidian Butte source, even though such obsidian would be more "costly" than was the Obsidian Butte material.

Hypothesis 3 - If Obsidian Butte obsidian became unavailable due to flooding, then the populations relying upon this obsidian would increase their reuse of Obsidian Butte obsidian discarded from previous activities.

It is likely that discarded or lost obsidian was reutilized on a fortuitous basis at all times. However, at times when the Obsidian Butte was flooded, such "scavenging" would probably intensify and become more systematic. Evidence of such reuse would be observable if some of the original flaked surface of the obsidian was left untouched after the second use. If cut in the right places, reused obsidian should have



two distinct hydration band widths. Three obsidian pieces from the McCain Valley sample were cut twice to determine if reuse had occurred, but the results were negative. A larger sample needs to be examined in this manner before any conclusions regarding reuse can be made.



#### IV. RESEARCH - HISTORY

##### 4.1 INTRODUCTION

Historical resources in the McCain Valley Study Area represent a wide range of sites including mines, ranches, and transportation routes. Several methods were used to provide an inventory of the historical resources. First, an historical review of each of the seven sections (outlined in the Introduction) was made, using county records, historical documents and monographs, photographs, and maps. Second, a field inventory was performed to assess the significance of the sites and to locate sites not already discussed in the Class I Overview (Wirth Associates 1978), nor previously identified by other investigators. Third, oral interviews--involving residents who worked or lived in areas surveyed as well as local historians--were conducted to provide an even more comprehensive account of the historical resources in the study area.

During the field study for this report, 141 historical sites were visited and recorded. Fifty-nine of the sites were related to mining; forty-one to ranching; twenty-four to retirement and recreation; and seventeen to transportation. The criteria for the classification of the historical sites are listed in Tables 56 and 57. Of the fifty-nine mining sites, forty-three are Class 2 and Class 3, and sixteen are Class 5 and 6. The forty-one ranch related sites contained twenty of Classes 2 and 3, fifteen of Class 5, four of Class 1, and two of Class 6. The twenty-four recreation and retirement sites include nineteen of Classes 5 and 6 and five of Classes 2 and 3. Finally, the seventeen sites related to transportation are divided into twelve of Classes 2 and 3, three of Class 5, and two of Class 1.

The small population in the study area is a reflection of the region's general lack of job opportunities. Most residents are either ranchers or retired. Because the study area is exceedingly dry and hot in summer, economic enterprises, always few in number, are necessarily temporary. But irrigated agriculture has been attempted unsuccessfully in the McCain Valley Study Area. Also, mining has been practiced sporadically or on a small scale since the major Julian gold rush of the 1870's.

In a substantial portion of the study area, settlement was the result of a major transportation route. The Overland Stage Route, known also as the Southern Emigrant Trail, passed through or near three of the study sections--Oriflamme, Vallecito/Canebrake, and San Felipe Hills. In the southern sections--Table Mountain and McCain Valley--settlement was also greatly influenced by the San Diego and Arizona Eastern Railroad, finally completed in 1919. Furthermore, the coming of the automobile saw the construction of the famous plank



road through the Imperial Valley to Yuma, and eventually Highway 80, both frequently used by settlers and ranchers in the McCain Valley Study Area.

The Great Depression brought into the area many optimistic miners and settlers hoping to get rich quick in the hard times. The Taylor Grazing Act of 1934, which permitted the leasing of land from the federal government, opened up several hundred acres in the McCain Valley Study Area for grazing and ranching. During World War II the need for minerals for the manufacture of weapons caused the development of several mines in the Table Mountain area. After the War, five-acre parcels were sold and much of the land was used for retirement communities. Today, the principal economic activities of the McCain Valley Study Area are ranching and recreation.



TABLE 56

SITE CLASSES

|         |                                                                                                                                                                                                               |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CLASS 1 | Sites in which most or all of the materials are considered historic (over 50 years old or associated with a significant event or activity, such as World War II). These sites must also be in good condition. |
| CLASS 2 | Sites containing both historic evidence and a substantial amount of non-historic evidence (recent material).                                                                                                  |
| CLASS 3 | Sites which are primarily historic, but the historic evidence is in poor condition.                                                                                                                           |
| CLASS 4 | Sites possessing historical significance, but lacking in physical on-site evidence (i.e., location of an event).                                                                                              |
| CLASS 5 | Non-historic sites in good condition.                                                                                                                                                                         |
| CLASS 6 | Non-historic sites in poor condition.                                                                                                                                                                         |

SITE ASSOCIATED ACTIVITIES

|                   |                                                                                                                                                                                                                                                                                                                                    |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A. EXPLORATION    | Involves historical sites associated with early expeditions, explorations, immigrations, and government surveys. Sites associated with this category are simply campsites and routes of travel.                                                                                                                                    |
| B. SETTLEMENT     | Includes those sites indicative of living activities and maintenance associated with settlement. Sites within this category include town, hamlet, mining camp, dug out, homestead, farm, ranch, school, cemetery, well, trash dump, and other structures associated with settlement.                                               |
| C. MILITARY       | Encompasses remnants of past military activities. Sites of this category include fort, camp, outpost, redoubt, and World War II training camps.                                                                                                                                                                                    |
| D. MINING         | This category covers activities specifically related to the extraction and processing of locatable, salable, and/or hardrock materials. Sites included in this category are mine, shaft, audit, tunnel, mill, arrastre, and mining works.                                                                                          |
| E. TRANSPORTATION | Deals with historical sites that were involved with public conveyance of passengers and/or goods, especially for a commercial enterprise, and sites directly related to this activity. Sites within this category are pack trail, wagon road, stage route, early automobile road, railroad, railroad station, and water stopovers. |



TABLE 57

SITE TYPES

| <u>CODE</u> | <u>TYPE</u>         | <u>DESCRIPTION</u>                                                                                                                                                                                                                |
|-------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01          | Town                | A compactly settled area usually larger than a hamlet.                                                                                                                                                                            |
| 02          | Hamlet              | A small settlement.                                                                                                                                                                                                               |
| 03          | Mining<br>Camp      | A settlement associated specifically with mining activities. This is also indicative of much more transient use than either a town or hamlet.                                                                                     |
| 04          | Homestead           | A tract of land acquired from U.S. public lands by filing a record and living on and cultivating the tract.                                                                                                                       |
| 05          | Farm                | A plot of land devoted to the raising of crops.                                                                                                                                                                                   |
| 06          | Ranch               | A plot of land devoted to the raising of beef cattle and/or other livestock.                                                                                                                                                      |
| 07          | Railroad<br>Station | The building, remains, and/or regularly scheduled stopping place of the train for the purpose of loading and unloading passengers and freight.                                                                                    |
| 08          | Post<br>Office      | A building and/or site once officially designated as a local branch of the U.S. Post Office.                                                                                                                                      |
| 09          | School              | A building used for educational instruction.                                                                                                                                                                                      |
| 10          | Structure           | Something that is constructed (e.g. building) of rock, adobe, wood, or a combination of these materials, or other material.                                                                                                       |
| 11          | Fort                | An official U.S. military designation for a permanent army post that is occupied continuously by troops.                                                                                                                          |
| 12          | Camp<br>(1800's)    | The lowest official U.S. military designation for an army post that is usually small but has a permanent detachment of men assigned to it.                                                                                        |
| 13          | Camp<br>(WWII)      | An official military post consisting mostly of tent structures and established as a base of operations for World War II training maneuvers.                                                                                       |
| 14          | Outpost             | An official military designation used in the 1860's to identify a temporary post to which a small detachment of men (usually a non-commissioned officer and 3 to 10 enlisted men) from a regional camp were temporarily assigned. |
| 15          | Redoubt             | A small, usually temporary, enclosed defensive work.                                                                                                                                                                              |



TABLE 57 (cont.)

| <u>CODE</u> | <u>TYPE</u>             | <u>DESCRIPTION</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16          | Mine                    | A pit or excavation in the earth from which mineral substances are taken.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 17          | Shaft                   | A vertical or inclined opening of uniform and limited cross section made for finding or mining ore.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 18          | Addit                   | A horizontal opening of uniform and limited cross section made for finding or mining ore.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 19          | Tunnel                  | A horizontal passageway through a ridge, hill or mountain and associated with mining activities.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 20          | Arrastre                | A device built to grind gold-bearing quartz. The early types consisted of a low stone and dirt wall built around a large and fairly level stone, hard pan or flat, rock-lined floor. A long horizontal beam was pivoted on a vertical post in the arrastre's center. One end of the beam was harnessed to a burro or mule to provide necessary power by walking in a circle outside the low arrastre wall. A heavy chain was fastened to the beam about midway, and the free end of the chain linked to a ring bolt wedged in a heavy drag stone(s). |
| 21          | Ore Mill                | A site where crushing machinery, usually steam-engine powered, was used to pulverize ore-bearing rock to facilitate the extraction of gold and/or other metals. Five- and ten-stamp mills were most common.                                                                                                                                                                                                                                                                                                                                          |
| 22          | Mining Works            | An area where mining and/or processing works (e.g. flumes, chutes, sorters, etc.) are present.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 23          | Dug Out                 | A shelter dug in a hillside or dug in the ground and roofed with sod or earth.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 24          | Railroad                | The remains of a permanent road having a line or rails fixed to ties and laid on a roadbed or berm and providing tracks for railroad cars.                                                                                                                                                                                                                                                                                                                                                                                                           |
| 25          | Automobile Road (Early) | Roads used for early automobile travel (e.g. Model-T, etc.).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 26          | Wagon Road              | Route habitually used by wagons pulled by draft animals.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 27          | Stage Route             | Trail utilized regularly by the stagecoach companies for handling passengers and mail.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 28          | Pack Trail              | Historic foot and pack animal (horse and mule) route of travel that was not used by wagons.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 29          | Exploration Route       | Routes taken by early explorers, expeditions travelers, and survey parties. Also included are routes for domestic livestock drives.                                                                                                                                                                                                                                                                                                                                                                                                                  |



TABLE 57 (cont.)

| <u>CODE</u> | <u>TYPE</u>         | <u>DESCRIPTION</u>                                                                                                |
|-------------|---------------------|-------------------------------------------------------------------------------------------------------------------|
| 30          | Cemetery            | A place with historic human internments associated with Euro-American activities (i.e. a historic burial ground). |
| 31          | Trash Dump          | A place where refuse or other discarded materials are accumulated or dumped.                                      |
| 32          | Well                | A deep hole or shaft sunk into the earth to tap an underground supply of water.                                   |
| 33          | Railroad Water Stop | A place along a railroad right-of-way where trains periodically stopped to take on water.                         |
| 34          | Isolated Find       | Singular occurrence of a historic artifact such as the following: bottle, stirrup, horseshoe, road grader.        |



## 4.2 HISTORICAL RESOURCES IN THE STUDY SECTIONS

### San Ysidro Mountains

The San Ysidro Mountains section which includes Montezuma Valley, is located directly east of what was one of the major routes into Southern California--the Southern Emigrant Trail. Entering San Diego County through Warner's Pass, the Emigrant Trail served as the main road between San Diego and the Colorado River until the 1870's, and was used extensively for military, fur-trapping, and mining expeditions. The economy of the lands along the trail flourished as the need for expeditionary supplies increased. Cattle ranching was the major economic activity of the lands surrounding the San Ysidro Mountains, through which the trail passed, even though dry farming was introduced there in the early 1870's. Cattlemen made the most of the limited valley land by grazing their cattle in the mountains and plateaus in summer, and in lower pastures in winter. The rocky, brushy slopes of the San Ysidro Mountains proved suitable only for limited grazing.

Most settlers and homesteaders came to the San Ysidro Mountain Area during the 1880's. William Johnson Helm (known as "Wid") was among the most prominent of the early pioneers. Helm settled in the area in April of 1882, taking out a patent on 160 acres of land. He built an adobe house and raised cattle. Helm also dry farmed, but was known chiefly as a cattleman and stock grower. His property in the Montezuma Valley (previously called Verruga Canyon) became known as the Helm Homestead. In the 1920's, Helm sold his ranch to Ralph Jasper, another cattleman.

The Montezuma Valley took its name from the Montezuma Mine which was developed during the 1930's. The county constructed a dirt road into the valley in 1960 and soon a post office and a school were built. But the inferior quality of the land and the lack of an adequate water supply discouraged settlement. Later, after the County paved the road (1964) as a thoroughfare from San Diego to the desert, more settlers came to the area. The community of Ranchita was established in 1960 with a store, post office, and ranch houses. Though the Montezuma Mine is still worked sporadically, most settlers in the San Ysidro Mountain Area are now retired and many practice small-scale ranching. Farming is also done, chiefly to feed stock in off season months.



## San Ysidro Mountains

### ORAL INTERVIEWS

| <u>DATE</u>   | <u>INTERVIEWEE</u> | <u>LOCATION</u>                          |
|---------------|--------------------|------------------------------------------|
| June 10, 1979 | Ted Brown          | Buck Canyon Road<br>Ranchita, California |

Ted Brown and his wife, retired, have been in the area since 1954. They built their home near Buck Canyon on the Old Mine Road in the San Ysidro Hills in 1974.

### POSSIBLE CONTACT:

|              |                                                            |
|--------------|------------------------------------------------------------|
| Leo G. Razee | 13452 Ogunquit Ave.<br>Poway, California<br>(714) 748-9126 |
|--------------|------------------------------------------------------------|

Leo G. Razee moved to Ranchita from San Diego in 1960 for health reasons. A retired carpenter, he became owner and operator of Ranchita Store, which is a combination post office, gas station, and market. He now lives in Poway, possibly for health reasons. Lived in Ranchita at least fourteen years. Not able to contact.



## Historical Sites--San Ysidro Mountains

### Visited Sites

#### MONTEZUMA VALLEY ROAD

CLASS: 5

ACTIVITY: E

SITE TYPE: 25

DATE OF ORIGIN: June 1964

CADASTRAL LOCATION: T-11S, R-4E, Sec. 13, 14, 15

LOCATION REFERENCE: Montezuma Valley Road runs through Verruga Canyon and Montezuma Valley from the San Felipe Road junction, through Ranchita, and on to Borrego Springs. The road is relatively new (built in 1964) and became a better alternative route to the desert, rather than the deteriorating Grapevine Canyon Road to the south.

DESCRIPTION: The 14.5 mile link from San Felipe Road junction to Borrego Springs was opened on June 24, 1964 as a 2-lane paved road. Value of the road was put at \$500,000.00. It was termed as a shortcut from San Diego to Borrego Springs (Union 3/16/64, 9:4-5; 6/7/64, 19:2-5) with an 8% grade (Union 11/24/63, 13:2-3; 2/1/64, 14:8). In 1969, the road was realigned and straightened for a 3-mile section along Ranchita (B 11/9/69, 3:7-8). Today the road is in good condition.

#### RANCHITA

CLASS: 2

ACTIVITY: B

SITE TYPE: 04, 06, 08

DATE OF ORIGIN: Early 1880's to present

CADASTRAL LOCATION: T-11S, R-4E, Sec. 13, 14  
R-5E, Sec. 18

LOCATION REFERENCE: Ranchita is located in Montezuma Valley, a high plateau overlooking the Anza-Borrego Desert. Directly above Borrego Springs and southeast of Warner Springs.

DESCRIPTION: Rather than a compact town, Ranchita is a community spread over acres of land in the Montezuma Valley. Because its economy is ranching and grazing, the houses are widely separated. The little-known community has approximately 200 residents, most of whom are retired. There is one small store along Montezuma Valley Road, built by Leo Razee in 1960, which also serves as a post office and gas station. A parrot farm, a trailer park, a school for exceptional children, a rehabilitation ranch (Ranchita Oaks) and the County's Montezuma Honor Camp (built in 1954, a branch of the San Jose camp of Lake Henshaw, Union, B 5/26/69, 3:6-8; C 11/28/69, 10:3; B 4/24/72, 2:4-5) are part of the community (Union 4/27/54, 10"6; 11/27/56, 2:5). Most of the ranches in the area north and west of Ranchita store are fairly recent, however, several parcels of land here were homesteaded



by such men as the Helm Brothers (Wid Helm had a ranch with an adobe ranch house west of the present-day store) in the 1880's. Only one or two of the ranches directly north of Ranchita Store fall in the study area and they are discussed separately below. Buck Canyon, to the northwest, also has several structures which are described below.

#### CHERRY CANYON RANCH

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1930's?

CADASTRAL LOCATION: T-11S, R-5E, Sec. 7,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Located to the northwest side of Cherry Canyon jeep trail.

DESCRIPTION: The ranch house structure stands above the pasture area on the side of the hill. A creek runs through the canyon. A recent well with a pump sits near the creek bed. The two structures on the hill consist of a small wooden structure with a tin chimney and roof, and a more recent structure surrounded by trees. Some sort of wooden supports lie at the southern edge of the hill.

#### OLD MINE ROAD

CLASS: 2

ACTIVITY: E

SITE TYPE: 25

DATE OF ORIGIN: 1930's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10, 15

LOCATION REFERENCE: The Old Mine Road leads from Montezuma Valley Road up into San Ysidro Mountains, into Buck Canyon and Bergstrom Canyon.

DESCRIPTION: Today, the Old Mine Road is a dirt road used for access to ranches on each side of the road and to cabins in Buck Canyon. The road was most likely put through in 1932 when the Montezuma Mine was discovered.

#### RANCHO ROBADA

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: Early 1900's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 15,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Located to the east of the Old Mine Road, approximately  $\frac{1}{2}$  mile from Montezuma Valley Road.

DESCRIPTION: Rancho Robada consists of several wooden structures,



probably ranch houses and equipment sheds. Possibly homesteaded at the turn of the century, a few of the houses are occupied today.

#### MONTEZUMA RANCH

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1930's?

CADASTRAL LOCATION: T-11S, R-4E, Sec. 15,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Located at a fork in the Old Mine Road. The west fork leads up into Buck Canyon. The east fork leads to Montezuma Ranch.

DESCRIPTION: Wooden ranch house structure and corrals. Occupied.

#### TED BROWN STRUCTURE

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1974

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Located on the west side of the Old Mine Road before the road fords into Buck Canyon.

DESCRIPTION: Ted Brown built this structure of concrete and wood in 1974. It stands on a hill overlooking Grapevine Canyon and the Valle de San Jose on the west. Retired, Ted Brown and his wife live in the house. Several small wooden sheds surround the house.

#### BLUE ALUMINUM STRUCTURE

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1970's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Located on the east side of the Old Mine Road, this structure is located northeast of the Ted Brown structure a few hundred feet.

DESCRIPTION: Modern blue aluminum structure used as a house, temporarily abandoned. The barn-like structure has a flat roof and a brick chimney.

#### CABIN WITH STONE CHIMNEY

CLASS: 1

ACTIVITY: B



SITE TYPE: 10

DATE OF ORIGIN: 1890's-1900's?

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located on a trail extending southeast from the Old Mine Road, north of the blue aluminum structure. The cabin can be seen directly northeast from the Ted Brown structure.

DESCRIPTION: A small, wooden cabin which sits high on a hill overlooks Montezuma Valley as well as Valle de San Jose and Lake Henshaw. The abandoned cabin has a chimney and fireplace made of rock. The horizontal wooden planks are painted white and some recent additions were made to the cabin in later years, such as screen doors and other equipment. Roofing is of tarpaper, windows are of paned glass, and the doors are wooden. A wooden fence circles the house and a wooden outhouse stands east of the cabin. The cabin may have been used by a homesteader who had a good view of the land on which he grazed cattle. Fertile pastures lay directly below in Montezuma Valley.

#### STRUCTURES AT ENTRANCE TO BUCK CANYON

CLASS: 2

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1930's?

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located just north of the fork in the Old Mine Road where the Buck Canyon fork runs eastward. The structures are located on the southeast side of Buck Canyon Road above the creek bed.

DESCRIPTION: The Buck Canyon structures consist of 4-5 houses or shacks, possibly built for the families associated with the Montezuma Mine in 1932. It is also possible that the structures were built earlier when homesteaders claimed the land. One structure is a plywood shack with tarpaper shingles and a tin chimney. Another structure, possibly inhabited today, is wooden with a brick chimney, probably used for storage. Two other structures are wooden with paned windows. A tin outhouse stands nearby. A cistern also stands on the property.

#### BUCK CANYON STRUCTURE #2

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1950's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located on the northwest side of Buck Canyon Road.

DESCRIPTION: A painted red cabin with a cobblestone and modern



cement brick base. Tin roof. A brick storehouse lies to the north of the house and an abundance of equipment surrounds the house. Cattle may be grazed in the area behind the house. A retired couple live in the fairly recent structure.

#### BUCK CANYON STRUCTURE #3

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1930's-1940's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located on the northwest side of Buck Canyon Road, south of a fork in the road.

DESCRIPTION: Wooden structure with tin chimney and paned windows. Now abandoned, the structure was probably used as a miner's home after the Montezuma Mine was discovered.

#### BUCK CANYON STRUCTURE #4

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

CADASTRAL LOCATION: T-11S, R-4E, Sec. 11,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Located at the end of Buck Canyon Road.

DESCRIPTION: Fairly modern olive-green painted plywood cabin with windows. Abandoned, but probably used temporarily as a seasonal cabin.

#### MONTEZUMA MINE (301-1)

CLASS: 2

ACTIVITY: D

SITE TYPE: 16, 21, 10

DATE OF ORIGIN: February 1, 1932

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: The mine is located along a road west of Buck Canyon and east of Bergstrom Canyon. The mine road connects the two canyon roads.

DESCRIPTION: Large tailings signify the location of the Montezuma Mine. Discovered in February of 1932, the mine was located and recorded on August 21, 1932 by Jules B. Baron and his wife Daisy Baron. The area became known as the Montezuma Mining District (Mining Claims Book #154, p. 160). The mill site for the mine was located the same day and became known as the "Little Daisy" Mill Site adjoining the mine (Book #154, p. 160-161). The only remains of the mill site today are its concrete foundation with iron fixtures situated on both sides of the road. The wooden structure of the mill has collapsed. Mining equipment



is scattered nearby. Pits and tailings from the mine are near the mill site. Further up the road is an inhabited structure--probably the former mine supervisor's house. It is a wooden house with corrugated tin and no chimney. The mine may still be used on a small scale.

#### "SEVEN B" MINE

CLASS: 2

ACTIVITY: D

SITE TYPE: 16, 10

DATE OF ORIGIN: 1930's-1940's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10, ¼-SW

LOCATION REFERENCE: This small mine is located to the south of the Montezuma Mine Road as it heads toward Bergstrom Canyon.

DESCRIPTION: The mine is locatable by the tailings on the land. A wood-frame cabin with tarpaper walls and rolled sheet tarpaper roofing stands near the road. The structure has a tin chimney and is currently abandoned. Further down the road, on the north side, is a mine pit with iron equipment. The pit is possibly a filled-in shaft, and now stands approximately 12 feet deep.

#### BERGSTROM CANYON STRUCTURE

CLASS: 2

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1930's-1940's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10, ¼-NW

LOCATION REFERENCE: Located at the high east end of Bergstrom Canyon on a hill overlooking the Valle de San Jose. Located on the south side of Bergstrom Canyon Road.

DESCRIPTION: Inhabited, the structure is of wooden slat composition. A second-story loft-type addition has been added in recent years. A shack with a tin chimney stands nearby. The structure was probably used by a miner when the Montezuma Mine was discovered in the 1930's.

#### Non-Visited Sites

##### VERRUGA MARBLE DEPOSIT

CLASS: 2

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: Early 1920's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10, ¼-SW

LOCATION REFERENCE: Along Montezuma Mine Road, near the Montezuma Mine.



DESCRIPTION: Marble was quarried in this area in the early 1920's but with the cost of transportation, the mine proved unprofitable and operations ceased by 1923.

#### VERRUGA

CLASS: 2

ACTIVITY: D

SITE TYPE: 03

DATE OF ORIGIN: Early 1920's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10, ¼-SW

LOCATION REFERENCE: Along Montezuma Mine Road, near the Montezuma Mine. The exact location of the tiny community cannot be pinpointed without extensive research. The small "town" is no longer in existence, but some of the cabins described in the earlier tables may have been part of the community.

#### ROSE MARIE LODE

CLASS: 2

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: October 19, 1939

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10, ¼-SW

LOCATION REFERENCE: Along Montezuma Mine Road, ½ mile northeast of the Montezuma Mine in Buck Canyon.

DESCRIPTION: The Rose Marie Lode, located in the Rice Mining District, was discovered by Frank Becika in 1939. No large scale mining was done. Ore was probably ground at the Montezuma Mine's mill.

#### P.K. MINE GROUP

CLASS: 2

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: 1930's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 10, ¼-SW

LOCATION REFERENCE: Near the Montezuma Mine in Buck Canyon near San Ysidro Mountain.

DESCRIPTION: In the P.K. Mine Group were P.K. #2, P.K. #2, P.K. #3, and P.K. #4 mines. P.K. was short for "Preacher's Kids," as the owners of the mines were two preachers. Their children did the work in the mines. The P.K. #4 produced the most tonnage, which was trucked 84 miles to a mill at Jacumba (General Mine File, San Diego Historical Society).



## San Felipe Hills

The San Felipe Hills section, located on the east side of the Peninsular mountain range and at the edge of the Anza-Borrego Desert, are surrounded by valleys which give the area its reputation as "the gateway to Southern California" (Pourade 1966). San Felipe Valley, situated along the western side of the hills, runs from the northwest edge of the hills approximately twelve miles to Scissor's Crossing and the mouth of Earthquake Valley to the southeast. Grapevine Canyon lies to the east of the range, extending from Montezuma Valley in the north to Sentenac Canyon and Yaqui Flat in the southeast.

The San Felipe Hills have little historical significance. But the San Felipe Valley played an important role in the history of Southern California. Named after St. Phillip by Pedro Fages when he discovered it in 1782, the valley had been the traditional trade route of the Kamia, Cahuilla, Diegueno, and Luiseno (Journal of San Diego History, Volume XIV, 3:28). The valley soon become the "southern gateway" to California for explorers, trappers, emigrants and soldiers. The Spanish padres made several trips into the San Felipe Hills area in the 1800's to convert the natives. Exploring parties sent by the padres and the military also visited the area in the 1820's (Long and May 1970:19). The Mexican government had San Felipe Valley surveyed in 1826 for a possible mail and trade route to Sonora; a road, known as the Sonora Trail, was then made through the valley.

In July, 1834, the Mexican land grant of the San Felipe Rancho was awarded to Luis Arenas. The rancho consisted of 9,972.08 acres, part of which falls in the study area of San Felipe Hills. In 1846, the grant was legally transferred to Felipe Castillo and cattle (raised mostly for their hides) and horses were grazed on the unfenced land. In 1847, the grant was transferred to Don Juan Forster; in 1850, it was again sold to Francois L.A. Pioche and J.B. Bayerque. In 1900 the property was bought by Thomas L. Duque who built a large two-story adobe and wood frame ranch house near the southern end of the grant, in San Felipe Valley. The ranch house still stands (Meyer 1969; Long and May 1970).

In 1846, Kit Carson travelled through the San Felipe Valley, met General Stephen W. Kearney and his troops enroute to California, and led them through the valley northward to their destination. On December 1, 1846, Kearney and his men camped at the San Felipe Rancho and then continued to Warner's Ranch. In January, 1847, the Mormon Battalion under Lt. Col. Phillip Cooke followed the same route through the valley in order to establish a military wagon route from Iowa to San Diego. In following years many men used the San Felipe Valley as a southern route for reaching the gold-rich lands of central and northern California.



One of the most significant and well-remembered occurrences in the history of the San Felipe Valley was the arrival of the Overland Stage Line in 1858. Shortly before the appearance of the stage line, the valley was surveyed by the Army Corps of Engineers under Lt. Williamson to find a feasible southern route for the transcontinental railroad. The railroad never did go through the San Felipe Valley, but in 1857, Congress authorized a mail route from St. Louis to San Francisco via the southern route. John Butterfield and his associates were granted the contract for the route.

The Butterfield Overland Stage Line, or as it was also known, the Butterfield Overland Mail Company Toll Road, ran from October in 1858 to April of 1861. Stops along this southern part of the route included Carrizo Creek, Palm Springs, Vallecito, San Felipe, San Pasqual, Santa Ysabel, Warner's Ranch, and Oak Grove (Westways 1961). At the outset of the Civil War, the stage route was abandoned but the road through San Felipe Valley continued in use as the Southern Emigrant Trail.

In late 1949 or early 1950, the San Felipe Valley Road was paved by the County of San Diego. A two-lane road, it became known as County Highway S-2 (see Tables for references). The original Overland Stage Route was reportedly shorter than the modern paved route. The stage route measures 15.58 miles between the San Felipe Stage Station and the Butterfield Station, or Warner's Ranch. Warner's Ranch to the Oak Grove Station measured 15.66 miles (Wright 1961).

In 1903, the Indians of the San Felipe Valley were moved to Pala in Pauma Valley (Westways 1961). Several ranches besides the San Felipe Rancho had been homesteaded in the valley by this time. One of the more prominent ranches was that of Teofulio Helm, a Cupeno Indian who homesteaded 500 acres in the northern end of the valley (not in the San Felipe Hills, but just a few miles to the northeast of the study area). The County Road S-2 reaches its highest elevation between San Diego and the desert of Teofulio's ranch property, a half mile north of San Felipe, and in 1975, this summit was named after Teofulio in honor of his many contributions to the San Felipe community and the surrounding area (Biographical Files Helm, Teofulio, San Diego Historical Society). In 1902, Teofulio had built an adobe and several large farm buildings on his ranch which was located in major portions of Sections 19 and 20, Township 11 South, Range 4 East. He grazed cattle on more than 1000 acres, part of which was a government lease. The adobe home and farm buildings reportedly still remain, but the ranch land itself has been sold except for thirteen acres. Teofulio kept gardens and orchards on his ranch and raised horses, sheep, goats, chickens, and domestic animals. He constructed and operated a store across the road from his house (possibly the present-day store which operates at San



Felipe on the west side remain barren of any structures.

On the east side of the San Felipe Hills lie Grapevine Canyon and the dirt trails which wind through it. San Diego County has one other canyon by the same name as well as two creeks, a natural spring, and a mountain. The Grapevine Canyon of the San Felipe Hills is situated ten miles southeast of Warner Springs. Grapevine Creek rises near Desert View in the mountains and runs down Grapevine Canyon westerly toward Borrego Valley. Grapevine Mountain, with an elevation of 3,995 feet lies at the southeast outlet of the canyon (Canyon File n.d.).

The Grapevine Mine, now abandoned was discovered in 1938 in the Grapevine Canyon, at which time Grapevine Trail was probably improved to a narrow wagon road in order to haul equipment and ore. Mining did not greatly influence the surrounding communities, for ranching was and is the primary economic concern of the area. In 1940, a large brush fire burning thousands of acres, rushed through the rocky grazing land of the canyon from Montezuma Valley to the Borrego Valley (Union 7/26/40; 7/27/40). The land of the canyon was described as mostly grazing land on the edge of the desert. Today the dirt road is frequented only by off-road vehicles.



ACTIVITY: 2

SITE TYPE: Historical Sites--San Felipe Hills

DATE OF ORIGIN: 1979

CADASTRAL LOCATION: San Felipe Hills

LOCATION REFERENCE:

ORAL INTERVIEWS

DATE

INTERVIEWEE

LOCATION

June 10, 1979

Ted Brown

Buck Canyon Road  
Ranchita, California

Ted Brown and his wife, retired, have been in the area since 1954. They built their home near Buck Canyon on the Old Mine Road in the San Ysidro Hills in 1974.

POSSIBLE CONTACT:

Leo G. Razee

13452 Ogunquit Ave.  
Poway, California  
(714) 748-9126

Leo G. Razee moved to Ranchita from San Diego in 1960 for health reasons. A retired carpenter, he became owner and operator of Ranchita Store, which is a combination post office, gas station, and market. He now lives in Poway, possibly for health reasons. Lived in Ranchita at least fourteen years. Not able to contact.



## Historical Sites--San Felipe Hills

### Visited Sites

#### PAROLI SPRING-SAN FELIPE STAGE STATION SITE

CLASS: 3

ACTIVITY: E

SITE TYPE: 27, 10

DATE OF ORIGIN: Late 1850's

CADASTRAL LOCATION: T-12S, R-4E, Sec. 3,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located on the east side of Highway S-2 at the western foot of the San Felipe Hills. Southeast of San Felipe and San Felipe Creek. Approximately halfway between Warner's Ranch and Scissor's Crossing.

DESCRIPTION: Warren F. Hall built the San Felipe Stage Station in the 1850's and operated it for the 3 years that the Butterfield Stage was in action. The station was later used by other transport companies and by the military (Journal of San Diego History, Vol. XIV, 3:28). Today, the stone foundation of the small (approximately 10' x 20') station is surrounded by small trees. Iron wall reinforcements, cement, and a brick with cement chimney are on the property. More recent additions, such as an old refrigerator, concrete rings for water, as well as 3 concrete troughs, are scattered around the ruins of the structure. The spring, now dry, is surrounded by 6' x 8' concrete walls approximately 4' high and covered with wooden planks. A cobblestone type fence lies to the rear of the structures. A large corral stands in front of the structures, closer to the road, with the planks stood on end to reach 6' in height. This was probably originally used for horses. The corral may be used for seasonal cattle grazing today as cattle paths surround the area. A jeep road leads up to the San Felipe Hills but ends and there are no further structures.

#### PICCOLA CASA RANCH

CLASS: 5

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1970's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 33,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located to the east of Highway S-2, southeast of San Felipe, east of San Felipe Creek, and southeast of the County Engineer Maintenance Station.

DESCRIPTION: Very recent ranch house with modern equipment on the property.

#### DEPARTMENT OF TRANSPORTATION COUNTY ENGINEER MAINTENANCE STATION

CLASS: 5



ACTIVITY: B  
SITE TYPE: 10  
DATE OF ORIGIN: Recent  
CADASTRAL LOCATION: T-11S, R-4E, Sec. 33,  $\frac{1}{4}$ -NW  
LOCATION REFERENCE: Located to the west of Highway S-2, south-east of San Felipe, east of San Felipe Creek.  
DESCRIPTION: Cluster of recent structures, one of which is an occupied house. Other structures used as the maintenance station.

#### ISOLATED FIND OF RANCH-TYPE EQUIPMENT

CLASS: 2  
ACTIVITY: B  
SITE TYPE: 34  
DATE OF ORIGIN: Unknown  
CADASTRAL LOCATION: T-11S, R-4E, Sec. 28,  $\frac{1}{4}$ -SW  
LOCATION REFERENCE: Located near a dirt road leading from Highway S-2 on the east side, towards the San Felipe Hills.  
DESCRIPTION: Various isolated rusted equipment, possibly dumped as trash by nearby ranches. No structures or foundations were discovered in the area.

#### JAY W. REVELL PROPERTY

CLASS: 5  
ACTIVITY: B  
SITE TYPE: 06  
DATE OF ORIGIN: 1970's  
CADASTRAL LOCATION: T-11S, R-4E, Sec. 29,  $\frac{1}{4}$ -SE  
LOCATION REFERENCE: Located to the east of Highway S-2 directly northwest of the isolated find listed above. Southeast of San Felipe.  
DESCRIPTION: Very recent house structure, also an aluminum or tin barn.

#### SAN FELIPE COMMUNITY

CLASS: 3  
ACTIVITY: B  
SITE TYPE: 02  
DATE OF ORIGIN: Late 19th century  
CADASTRAL LOCATION: T-11S, R-4E, Sec. 20,  $\frac{1}{4}$ -SW  
LOCATION REFERENCE: Structures of San Felipe, both historic and recent, line both the east and west sides of Highway S-2.  
DESCRIPTION: Five wooden structures, one of which is a small store, still remain. In the late 19th century, as homesteaders settled parts of the valley, San Felipe had a schoolhouse. Several tin shacks also remain. Most of the structures are abandoned and more recent dwellings have been built along Highway S-2



further north. The San Felipe town-site was more or less abandoned in 1918 as water was scarce for settlers. There was a well in San Felipe and the area was believed to be a former Indian village (Rancho File, San Diego Historical Society, Serra Museum). To the north of the actual town-site lay several wooden shacks and structures called "Rock Crest." An old barn with a new house structure are on the east side of the Highway.

SAN FELIPE VALLEY ROAD, OR COUNTY HIGHWAY S-2

CLASS: 1

ACTIVITY: E

SITE TYPE: 25, 27, 29

DATE OF ORIGIN: 1782 to present

CADASTRAL LOCATION: T-11S, R-4E  
T-12S, R-5E

LOCATION REFERENCE: The road runs through the San Felipe Valley of 10,000 acres between the Volcan Mountains and the San Felipe Hills.

DESCRIPTION: San Felipe Valley Road is now a 2-lane County Highway stretching from just east of Warner's Ranch in the north to Scissor's Crossing in the south, in Anza-Borrego Desert. The road was unpaved until the late 1940's or early 1950's (Union 6/15/47, 7:4 and 4/10/49, 6:4, requests for improvement by the County). The road is important historically for its role in Southern California as a transportation route. It is known variously as the Sonora Road, Colorado Road, Southern Emigrant Trail, and the Butterfield Stage Route. The San Felipe Valley was discovered in 1782 by Pedro Fages enroute from the Colorado River to San Diego. The padres in the early 1800's did some exploring in the valley, also tending to the San Felipe Indians (Long, Paul V., An Archaeological Survey of Rancho San Felipe, p. 19). Later the valley was surveyed by the Mexican government in order to arrange a mail and trade route to Sonora. A road was made through the valley and became known as the Southern Emigrant Trail. American fur trappers traveled the route in the 1830's. In 1834, the Rancho San Felipe was granted by Mexican Governor Figueroa. In 1846, S.W. Kearney and his Army of the West camped in the valley and followed the route on their way to San Pasqual. In January of 1847, the Mormon Battalion under Lt. Col. Cooke traveled through the valley on their way to San Diego. At the time of California's Gold Rush, San Felipe Valley was used as a route to the Central Valley. In 1857 a filibustering expedition to Mexico traveled south through the valley. Also in this year, the San Diego-San Antonio Jackass Mail Route was established (Rancho File, SDHS). In 1853, the Army Corps of Engineers under Lt. Williamson surveyed the valley for a trans-continental railroad route. Though the RR did not go through, a mail route from St. Louis to San Francisco was contracted to John Butterfield and associates in 1857. Between October 1858 and April 1861, the Butterfield stages traveled the route which came to be known as the Butterfield Overland Mail Company Toll Road. At the start of the Civil War, the route was



terminated but the road continued in use as the Southern Emigrant Trail.

#### GRAPEVINE CANYON ROAD

CLASS: 2

ACTIVITY: E

SITE TYPE: 26

DATE OF ORIGIN: 1930's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 22, 23, 25, 26, 36

LOCATION REFERENCE: Grapevine Canyon Road runs through Grapevine Canyon which opens on the north to Montezuma Valley Road and runs southeasterly along the San Felipe Hills, south of the Grapevine Hills and to Yaqui Flat of the Anza-Borrego Desert.

DESCRIPTION: The road is a narrow dirt trail, probably built in the 1930's when the Grapevine Mine was discovered and when a couple of ranches were homesteaded in the area. The canyon was known as a shortcut from Warner Springs to the Imperial Valley. It was named from the fact that many grapevines grew in the valley. (Canyon File, SDHS) In 1940, the canyon suffered a brush fire which eventually burned thousands of acres. The canyon land was described as "rocky grazing land" (San Diego Union, 7/26/40; Tribune Sun, 7/25/40). Power lines run along the road (a 1938 document reported that the Sierra Nevada Power Line ran through the canyon). Fences made of branches with barbed wire run along several acres of the road. In several places the road has been used as a dumping area in recent years. Now used as an access road to ranches and as an off-road vehicle road.

#### ESPERANZA RANCH

CLASS: 5

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1950's?

CADASTRAL LOCATION: T-11S, R-4E, Sec. 15, ¼-SW

LOCATION REFERENCE: Located at the north entrance of Grapevine Canyon on Grapevine Canyon Road, east of the San Felipe Hills, directly south of Montezuma Valley Road.

DESCRIPTION: Modern ranch house and surrounding structures with corrals.

#### TIERRA DONOSA RANCH

CLASS: 5

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1970's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 22, ¼-NE

LOCATION REFERENCE: Located on the east side of Grapevine Canyon road in Grapevine Canyon.



DESCRIPTION: Modern ranch house with fenced-in grazing area. Trailers on property.

#### GRAPEVINE MINE

CLASS: 2

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: August 4, 1938

CADASTRAL LOCATION: T-11S, R-4E, Sec. 36, ¼-NE

LOCATION REFERENCE: Located in Grapevine Canyon north of the point where the canyon turns eastward. The mine is located on the east side of Grapevine Canyon Road, below the San Felipe Hills.

DESCRIPTION: A small, tin shack or cabin stands on the property near the mine. Ore ridges and tailings are the only evidence of the mine today. The mine was discovered by C.O. Carlson and Oliver P. Ensley, and was described as being 500' north of the entrance to Grapevine Tunnel and 300' east of the Sierra Nevada Power Line House in Grapevine Canyon (Mining District Claims Book 817, p.80). Known as the Grapevine Lode Mining Claim located in the Grapevine Canyon Mining District. The Grapevine #2 Mine was discovered on August 7, 1938 by the same men plus Mayme Williams. It was described as being located above the Grapevine Canyon Ranch house (Book 802, p.315). Today the mine and the tin shack are abandoned.

#### SIERRA NEVADA POWER LINE HOUSE SITE

CLASS: 3

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1930's?

CADASTRAL LOCATION: T-11S, R-4E, Sec. 36, ¼-SE

LOCATION REFERENCE: Located to the west of Grapevine Canyon road at the edge of the road and southwest of the Grapevine Mine.

DESCRIPTION: The power house was wooden with a concrete base and concrete supports terraced in 4 sections. The wooden part of the structure has collapsed and the concrete is exposed. The wooden planks have collapsed onto the hillside below the house site.

#### GRAPEVINE CANYON RANCH

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1920's or 1930's

CADASTRAL LOCATION: T-11S, R-4E, Sec. 36, ¼-SE

LOCATION REFERENCE: Located on Grapevine Canyon Road at a fork in the road. Part of the valley heads toward the San Felipe Hills and the other part runs east toward the desert.

DESCRIPTION: Ranch house structures are still being used today.



Pigs as well as cattle are raised. Main ranch house is wooden. There are several tin and wooden sheds for ranching implements, also several fenced corrals and pens. Eucalyptus and pine trees surround the structures.



### Banner/Julian

In the 1870's, cattle ranching thrived in San Diego County. By this time, most of the county had been surveyed and settlers began homesteading. Banner was but one of hundreds of valleys used by settlers for ranching and farming. Situated at the edge of the desert and the base of the mountains, the canyon runs three-and-a-half to four miles from a northwest to south-east direction, opening into the San Felipe Valley (L.B. Hunsicker's Notes, Canyon File n.d.). A few men homesteaded in the valley (see Lopez Homestead, A-Bar-A-Ranch-A in the Tables) and cattle were driven from the desert to such valleys to graze in the dry summer months.

San Diego County's first and only major gold rush was to change the entire character of the Julian/Banner Canyon area. While San Diego's New Town was being developed, gold was discovered by A.E. (Fred) Coleman in January of 1869 at what became known as Coleman Creek (running west and south of Julian). When news of the discovery reached San Diego, men began flocking to the area, hoping to claim land. Arriving at Coleman Creek they found much of the land had already been claimed; therefore they scattered in small parties, searching for the gold-bearing ore. Quartz mines were discovered daily in the Julian area--the Van Wert and Washington Mines were among the first--and the hills surrounding the area were scoured by dozens of prospectors.

The Julian Mining District was formed in February of 1870 with Mike S. Julian as first mining recorder.\* As the mining interest grew, the town of Julian began to develop. Drury D. Bailey, who had bought the land to farm in 1869, began selling lots. A store and hotel were built and soon mills followed to provide service to the number of mines found. Most of the Julian mines lie outside the study area section, but a few of the leading mines, such as the San Diego Mines (discovered March 3, 1870) and the Helvetia (discovered August 4, 1870), fall within the territory.

The few farmers and ranchers in the area found a ready market for their produce as settlements developed. As their discoveries were reported in the San Diego Union, more miners rushed to the mountains on foot, horseback, or wagon. Although

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\*The Julian Mining District comprises the following land: Commences at the northeast corner of Section 4, Township 12 South, Range 4 East, runs westward 3 miles to the northeast corner of Section 6; thence south 3 miles to the northeast corner of Section 18; thence east to the southeast corner Section 18; thence southeast along the line of the Santa Ysabel grant to the southeast corner of said grant; thence along line of grant in a westerly direction 4 miles; thence in a direct line to the northwest corner of the Cuyamaca Grant; thence



there were difficulties in transportation and lack of machinery and financing, the miners still came.

On September 3, 1870, Louis B. Redman discovered the Redman Mine in the San Felipe Canyon (or Sentenac Canyon) at the bottom of Banner Grade, five miles southeast of Julian. A week later, Drury D. Bailey (founder of Julian) discovered the Ready Relief Mine joining the Redman. Several mines in the Banner Canyon area were found in the following months and a new mining district was formed, known as the Banner Mining District. Many Julian miners moved down the hill to the Banner Canyon area and several mills were transported or built at these new mines (Union (weekly) 1/12/1871, 3:4).

The area received the name of "Banner" because when Redman discovered the first mine, he staked his claim with the American flag (Ellsberg 1972:45). As more mines were discovered in Banner Canyon, Chariot Canyon, and the hills surrounding them, a community sprang up in the southeast end of Banner Canyon. Within three months after the first discovery, the community of Banner (elevation 2,785 feet) was in competition with Julian for the number of mills in use and buildings constructed.

High-paying mines were discovered in the following months, including the Hubbard Mines, Antelope Ledge, and the Hidden Treasure. Unlike the Julian area, the terrain of the Banner area was barren or covered by chaparral. Several of the mines sat precariously on the edge of barren hillsides. The ground was hard and rocky and much of the ore had to be recovered by means of blasting.

By 1871, the Banner community had grown into a town with saloons, a hotel, stores, and several stamp mills. A stream ran through the canyon in which the town was situated. Banner school district was formed in 1871. By May of 1871 "Banner City" had 150 voters and petitions were being signed to make it a separate voting district. By 1872, a post office was being planned. By 1874, Banner had two hotels, two stores, a butcher shop, two mill offices, a blacksmith shop, a large stable, three to four saloons, and 25 to 30 residences. A hundred and fifty men were employed in the mines and the total population of Banner was between 300 and 400 people (Union,

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along the north boundary of said grant to the northeast corner, thence south along line of said grant five miles, then five miles east, thence north to the southeast corner of the San Felipe Grant, thence along the west line of said grant, thence to the place of beginning (Julian District Mining Records, Claims of Mines for Working Purposes, San Diego County Operations Center.



6/14/74, 3:3). More buildings were being planned and town lots were much in demand (Union 7/9/74, 3:1; 7/22/74, 3:3-4). In 1882, Banner had its own voting precinct and became known as Banner judicial township (Union 11/26/82, 3:3).

In February 1871, George V. King discovered the Golden Chariot, Joker, and King Ledges, all located in a canyon running south from Banner Canyon which later became known as Chariot Canyon (Canyon Files n.d.). The ledges discovered by King were soon consolidated into the Chariot Mine, one of the richest gold-producing mines in the history of the area. In the fall of 1871, a wagon road was built to the Chariot Mine, three miles south of Banner, and a mill was set up at the site. An estimated \$500,000 was taken out of the mine (Elliot, p. 55) in its three years of operation (Davidson 1939).

The Ready Relief Mine, discovered by Drury D. Bailey at the head of Chariot Canyon, near Banner, proved to be a steady producer for many years. Other mines along the same belt as the Ready Relief included the Madden Mines, the Kentucky S., the Antelope, the Cincinnati Belle, and the Warlock. The Warlock was one of the first mines discovered and one of the last to be extensively worked (Ellsberg 1972:31) and today remains in the best shape in comparison to the other mines of the Banner area (see Tables).

By 1874, there were reportedly seventy-five stamp mills operating in the Julian/Banner Mining Districts (L.B. Hunsicker's Notes n.d.).

Because of the discovery of gold in Banner, a transportation route for equipment as well as men was necessary from Julian. In 1870-71, Banner Grade was known as the "Banner Slide" pack trail (Botts 1969:18-21) because of its steepness and poor construction for equipment wagons. By June of 1871, a good wagon road had been completed from Julian to the San Felipe Valley. The road was a six to seven mile toll route operated by Horace Wilcox (Ellsberg 1972:57). Stages transported the gold into San Diego from Julian.

In the late 1880's, some mines were reopened: the Helvetia and the Golden Gem Mines. With the discovery of the Gold King and the Gold Queen in 1888, the mines once again became active. A machinery boom in 1885 aided in furthering production. A San Diego Union article of 1887 reports that "at Julian, work is going on vigorously to discover more mines between that place and Banner" (Union, 2/27/87, 3:1). Work was being done on a greater scale on account of capital investment from midwestern or eastern companies (Union, 12/21/89, 2:1). By 1891, Julian mines were prospering. Mining and mill equipment was moved from less productive mines to the more prosperous ones (Union, 3/27/93, 5:4; 12/17/84; 3:1). In 1891,



Banner was also again developing on a greater scale.

By the late 1920's, most of the mines were closed and Banner residents turned once again to agriculture or ranching. Few structures remained in Banner from the mining camp days. After a fire in Julian, structures in Banner were razed in order to rebuild the town in the mountains (Banner File n.d.). The two-story Wilcox Hotel remained, housing Mrs. Lorin Wilcox, wife of the man responsible for the Wilcox Toll Road. Another store was built for the small community over the site of the original store owned by J.A. Noah. The Gold King Mill, the large white schoolhouse, and several other structures no longer remained. The schoolhouse was washed away in a flood (the creek in Banner Canyon often turned into a raging river) and only foundations remained in 1927. In 1941, Banner elementary school became annexed to the Julian Union Elementary School District (Union, 5/29/41, 5:4). The Wilcox Toll Station only had its stone foundation or walls remaining.

What was once a thriving mining town became a stopover for travelers approaching Banner Grade from the desert, and a home for a few miners and ranchers.

Most of the sites encountered in the Banner/Julian area are Class and Class 3--sites containing both historic evidence and a substantial amount of non-historic evidence, or sites which are primarily historic. Most sites, like the town of Banner, are more than one hundred years old; but they lack physical historical remains. Only a few of the large mines had any evidence of activity: the Warlock, the Cold Beef, the Ready Relief, and the Golden Chariot Mines. The sites are historically significant because of their age and because they represent an important era in San Diego County's history--its one and only gold ruse.

The ranch sites are less significant, for they did not influence the development of Banner. They did, however, provide the miners and other members of the community with necessary supplies. Several ranches are recent, not older than fifty years. The Banner/Julian area, then, was primarily a mining district.



Banner/Julian

ORAL INTERVIEWS

| <u>DATE</u>  | <u>INTERVIEWEE</u>      | <u>LOCATION</u>                                  |
|--------------|-------------------------|--------------------------------------------------|
| May 12, 1979 | Mabel Carson            | Julian Memorial Museum<br>Julian, California     |
| May 18, 1979 | Steven & Ellen Rubisell | Banner Store<br>Highway 78<br>Banner, California |

The Rubisells have lived in the Banner area for the last several years. They have frequent contact with area residents.

|              |                  |                                                           |
|--------------|------------------|-----------------------------------------------------------|
| May 19, 1979 | Charles Reynolds | Chariot Mine<br>Chariot Canyon Road<br>Banner, California |
|--------------|------------------|-----------------------------------------------------------|

Mr. Reynolds has lived on the Chariot Mine property for several years.

|              |                           |                                                                    |
|--------------|---------------------------|--------------------------------------------------------------------|
| May 19, 1979 | George L. Herrington, Sr. | 12784 Jackson Hill Drive<br>El Cajon, California<br>(714) 443-3202 |
|--------------|---------------------------|--------------------------------------------------------------------|

Mr. Herrington lives and mines at the Cold Beef Mine in Chariot Canyon. He has been in the Julian/Banner area since the 1920's and has worked in nearly every mine in the area. Presently, he is mining at the Cold Beef (once the Gold Reef). He is retired and spends most of his time at the mine.



Banner/Julian

Visited Sites

BANNER

CLASS: 2

ACTIVITY: B

SITE TYPE: 01

DATE OF ORIGIN: 1871-1874

CADASTRAL LOCATION: T-13S, R-4E, Sec. 2,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: North of Highway 78 at the east of Banner Grade.

DESCRIPTION: 10-15 structures, one of which is original. Banner Store was built in the 1920's over the basement of the original store. The remaining original structure is a small wooden house to the northwest of the store in Banner Canyon. The rest of the structures are recent trailers and wooden structures.

BANNER QUEEN TRADING POST, OR BANNER QUEEN RANCH

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1890's-1900's

CADASTRAL LOCATION: T-12S, R-4E, Sec. 35,  $\frac{1}{4}$ -SE  
T-13S, Sec. 2,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: North of Highway 78 and northeast of Banner.

DESCRIPTION: Once the site of a late 1890's or early 1900's mining camp, the ranch consists of a 2-story house (1893) and several other structures. The 2-story structure once was used as the mine superintendent's quarters. After the mines were abandoned, the property was also deserted. In 1934, the land was bought by Bill and Adeline Mushet to be restored as a dude ranch and western-style retreat. The 2-story house with balconies and an arbor was restored and 2 cabins built further north of the house. A swimming pool was also added. The Mushets grazed cattle. Today, a wood and stucco house structure with a tin roof stands at the entrance gate along Highway 78 and serves as the Trading Post. Gas pumps and a corrugated tin and wooden beam shack stand to the east of the stucco structure. The shack houses peacocks and fowl. To the north and west of these structures are several other ones--one wooden house with a corrugated tin roof, a recent aluminum barn, and several plywood and tin shacks (San Diego Magazine, December, 1948; San Diego Union, 6/1/52; Union C 4/19/53, 6:1-8).

BANNER GRADE, OR THE WILCOX TOLL ROAD, OR BANNER GILBERT SLIDE

CLASS: 2

ACTIVITY: E

SITE TYPE: 25, 26, 28



DATE OF ORIGIN: 1870

CADASTRAL LOCATION: T-12S, R-4E, Sec. 33  
T-13S, R-4E, Sec. 2, 3

LOCATION REFERENCE: Now Highway 78, a 4-mile paved road leading from Julian to Banner in a southeasterly direction.

DESCRIPTION: The Banner Grade connected the towns of Julian and Banner in the early mining days. In the 1870's, provisions and mining equipment were loaded on a sled-like device at Julian and lowered to Banner. Horses pulled wagons with blocks in front of the wheels to prevent the wagons from overrunning them on the steep grade. The trail was known as the Banner Gilbert "Slide." In 1871, the Wilcox Toll Road was constructed between the two towns and extended on to the Southern Emigrant Route in San Felipe Valley. A toll was charged for everything, from pack mule to equipment hauling wagons. Today nothing remains of the stone based toll house at Banner. In 1934, Banner Grade was paved (Banner File, SDHS), and has been repaved a few times since. Today it is a 2-lane paved road.

#### CHARIOT CANYON ROAD

CLASS: 2

ACTIVITY: E

SITE TYPE: 26, 28

DATE OF ORIGIN: 1871

CADASTRAL LOCATION: T-13S, R-4E, Sec. 2, 11, 14, 23, 24

LOCATION REFERENCE: Dirt road, 4-5 miles long leading in a southerly direction from Highway 78 at Banner.

DESCRIPTION: Now used as a graded dirt road for jeep and car access to property alongside the road, Chariot Canyon Road was once used as a burro and horse path when mines in the canyon area first opened (Golden Chariot, etc.). In 1872, a wagon road was built by Joseph Swycaffer for \$1,790.

#### RODRIGUEZ SPUR TRAIL

CLASS: 2

ACTIVITY: E

SITE TYPE: 26, 28

DATE OF ORIGIN: 1895

CADASTRAL LOCATION: T-13S, R-4E, Sec. 11, 12, 13

LOCATION REFERENCE: Three mile dirt road leading in a southeasterly direction from Chariot Canyon Road.

DESCRIPTION: Probably built in 1895 for access to Ranchito, Aguaito and Elevada Mines. Used today as a jeep and truck trail.

#### KENTUCKY, MADDEN, WARLOCK MINES TRAIL

CLASS: 2

ACTIVITY: E

SITE TYPE: 26, 28



DATE OF ORIGIN: 1870's

CADASTRAL LOCATION: T-13S, R-4E, Sec. 3, 4

LOCATION REFERENCE: Dirt trail which runs parallel to Banner Grade. South of Banner Grade, the trail leads in a southeast direction from Whispering Pines to Banner Canyon.

DESCRIPTION: Used first in the early 1870's for pack animals and access to the mines. Later expanded and used as a poor wagon road for access to the larger mines such as the Warlock. More recent spurs in the road cut down to Banner Grade.

#### VARIOUS ACCESS ROADS TO MINES

CLASS: 2

ACTIVITY: E

SITE TYPE: 26, 28

DATE OF ORIGIN: 1870's

CADASTRAL LOCATION: ----

LOCATION REFERENCE: Throughout mountain areas of Banner Canyon and Chariot Canyon.

DESCRIPTION: Small dirt roads and paths lead to mining pockets and shafts; once used as burro trails and later by wagons.

#### ANTELOPE MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: September 26, 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 3, ¼-NW

LOCATION REFERENCE: Northwest of Madden Mine along Warlock Road, west of Banner Grade.

DESCRIPTION: Discovered by Peter Kennedy, et.al., nothing remains of the mine except some tailings (Book A, p.220)

#### BEDROCK MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16, 19

DATE OF ORIGIN: April 2, 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 4, ¼-NE

LOCATION REFERENCE: Northeast of Madden Mine along rim of Banner Grade.

DESCRIPTION: Discovered by John W. Pace (Book A, p.81). No remains of the mine except tailings.

#### CHARIOT, GOLDEN CHARIOT MINES

CLASS: 2



ACTIVITY: D

SITE TYPE: 03, 17, 18, 21

DATE OF ORIGIN: February 13, 1871

CADASTRAL LOCATION: T-13S, R-4E, Sec. 23, ¼-NE

LOCATION REFERENCE: Three miles south of Banner along Chariot Canyon Road.

DESCRIPTION: Of the once-thriving mine, only two small cabins remain. Both are wooden, one painted white, the other green. The cabins were both part of the mining camp built in the early 1870's. Charles Reynolds (oral interview) resides in the white cabin. A wooden shack stands to the rear of this cabin. South of the white cabin are a few planks and some scattered equipment--remains of the Chariot Mill Site. In the early 1900's as many as 8 camp structures were on the property as well as a mill and various mining equipment. The mine was discovered by George V. King, Joseph Coyne, Richard Conners, D. McSellan, and J. Lang. In 1871, the first southerly extension was located by Chester Gunn, Austin Chambers, Wm. Holoran, Mike Mulheren and Chas. Holland (Book C, p.3, 6, 31). In 1888, Chariot #2 by R. G. Melrose, F.E. Feeler, and J.E. Hamilton (Book E, p.376). In 1907-1909, Golden Chariot #2 and #3 relocated by Bailey, Wilcox and Larsen (Book G, p.584,639). In 1923, Golden Chariot #3, #4, and #5 by Chalmer Bailey (Book H, p.265-266).

#### CINCINNATI BELLE MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 3, ¼-SW

LOCATION REFERENCE: Southeast of Madden Mines and northwest of Kentucky Mine along Warlock Road, southwest of Banner Grade.

DESCRIPTION: Relocated in 1917 by L.N. Bailey, Jr. and L.S. Wellington (Book H, p.73). Relocated in 1919 by Seth A. Davis (Book H, p.185). 1928: Proof of labor by C.A. Schindler, owner (Book I, p.131). Shafts, addits, tailings, and burned wood areas remain on the site.

#### COLD BEEF MINE (GOLD REEF MINE IN EARLY RECORDS)

CLASS: 2

ACTIVITY: D

SITE TYPE: 03, 17, 18, 21, 22

DATE OF ORIGIN: March 11, 1903

CADASTRAL LOCATION: T-13S, R-4E, Sec. 14, ¼-SE

LOCATION REFERENCE: Directly south of Golden Chariot Mine complex on Chariot Canyon Road.

DESCRIPTION: Discovered by R.G. Melrose (Book G, p.480). Mill site located on the same day (p.482). Northwest extension located the same day and named the Gold Leaf by R.G. Melrose (Book G,



p. 479). This mine is one of the few mines in the area still being worked today. George L. Herrington (oral interview) runs the mine. Several shacks of corrugated tin and Herrington's living quarters, a two-room wooden one-story structure remain. Several wooden shacks lie to the south. Some mining equipment from the early 1900's remains and several of the structures were built in 1948. A mill was built in 1948. Another mill site was built recently and is being used; 190' shaft. Rusted mining equipment lies over portions of the property. A small concrete reservoir lies to the north of the wooden living quarters structure.

#### GOLD CROSS MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: July 20, 1914

CADASTRAL ACTIVITY: T-13S, R-4E, Sec. 3,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: South of Cincinnati Belle Mine on slope of mountain.

DESCRIPTION: Tailings remain as evidence of the mine. Discovered by R.G. Melrose and Joseph Marks (Book G, p.779).

#### GOLDEN ELLA MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: 1870's

CADASTRAL LOCATION: T-13S, R-4E, Sec. 14,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Northwest of Golden Chariot Mine along Chariot Canyon Road.

DESCRIPTION: A few shafts and tunnels with tailings remain at the site.

#### GOLDEN STAR MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: December 26, 1886

CADASTRAL LOCATION: T-13S, R-4E, Sec. 14

LOCATION REFERENCE: West of the Golden Chariot Mine

DESCRIPTION: Relocated in January, 1912 by Joseph Marks and R.G. Melrose (Book G, p. 721). Once known as the Rattlesnake Mine. Only tailings remain today.

#### GOLDEN SUGAR MINE

CLASS: 3



ACTIVITY: D  
SITE TYPE: 16  
DATE OF ORIGIN: Late 1800's-Early 1900's  
CADASTRAL LOCATION: T-13S, R-4E, Sec. 14,  $\frac{1}{4}$ -NW  
LOCATION REFERENCE: Northwest of Golden Chariot Mine  
DESCRIPTION: No information could be found in the Julian Mining Records under this name. Only tailings remain of the mine.

#### HIDDEN TREASURE MINE

CLASS: 3  
ACTIVITY: D  
SITE TYPE: 16  
DATE OF ORIGIN: March 24, 1870  
CADASTRAL LOCATION: T-13S, R-4E, Sec. 3,  $\frac{1}{4}$ -SE  
LOCATION REFERENCE: Southeast of the Kentuck S. Mine  
DESCRIPTION: The mine was first located by D.Geary (Book A, p.54). The Hidden Treasure #2 was located April 2, 1870 by O.P. Powers, et.al. (Book A, p.69). Only tailings remain.

#### HUBBARD MINES

CLASS: 3  
ACTIVITY: D  
SITE TYPE: 16, 22  
DATE OF ORIGIN: 1871  
CADASTRAL LOCATION: T-13S, R-4E, Sec. 10,  $\frac{1}{4}$ -NE  
LOCATION REFERENCE: Southeast of the Ready Relief and situated on the crest of a hill near a trail which forks off to the northwest from Chariot Canyon Road.  
DESCRIPTION: The Hubbard Mines were originally a part of the Ready Relief complex. In December of 1888, the North Hubbard was located by G.N. Hazzard, S.A. McDowell, H.E. Cowles, et.al. (Book E, p.419). The mines were still being worked in 1909 and 1913 (Book G, p.653, 741). The Hubbard South was located in July, 1923 by Chalmer Bailey (Book H, p.267). A fork of the Chariot Canyon Road leads to the Hubbard Mine. Ore ridges, scattered wooden remnants and planks and a few pits remain today.

#### KENTUCK S. MINE OR KAINTUCK S. MINE

CLASS: 3  
ACTIVITY: D  
SITE TYPE: 16  
DATE OF ORIGIN: 1870  
CADASTRAL LOCATION: T-13S, R-4E, Sec. 3,  $\frac{1}{4}$ -SE  
LOCATION REFERENCE: East of the Cincinnati Belle and west of the Hidden Treasure Mine.  
DESCRIPTION: Relocated in April of 1888 by L.L. Wilcox (Book E,



p.382). Renamed the Kentucky Mine in April of 1919 by Seth A. Davis (Book H, p.182).

#### KEYSTONE MINE

CLASS: 2

ACTIVITY: D

SITE TYPE: 16, 17

DATE OF ORIGIN: Recent

CADASTRAL LOCATION: T-13S, R-4E, Sec. 14,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Located on a spur road leading from Banner Grade to the Warlock Mine.

DESCRIPTION: Recent plywood shack stands near the road. Several shafts nearby and large pieces of mineral-bearing rock.

#### LUCKY STRIKE MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: October 4, 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 14,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: East of Golden Sugar Mine, northwest of Golden Chariot.

DESCRIPTION: Discovered by W.D. Reynolds, J. Lawson, John Bush (Book A, p.234). 1872-surveyed and filed along with the Golden Rule. Only tailings and shafts remain today.

#### MADDEN MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 10, 17, 18, 21

CADASTRAL LOCATION: T-13S, R-4E, Sec. 3,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Southeast of Warlock and northwest of Kentucky S. Mines

DESCRIPTION: Discovered by John Madden, Michael Harrington, Richard Carrell and Frederick Carman (Book A, p.199). In September, 1870, first northwesterly extension found by Patrick O'Day (Book A, p.217). Re-opened in the 1900's. Relocated by Chas. W. Curry in January 1919--the Old Madden Mine (Book H, p.181). Old Madden Mill Site. Worked through 1924 (Book H, p.284). Scraps of lumber, tailings, and shafts remain on the site. A shaft and an adit are located in a hillside on the north side of the Warlock Road, perpendicular to each other. Scattered iron metal fixtures, a stone shack foundation, and burned areas where wooden shacks possibly stood, remain.

#### NEPTUNE MINE

CLASS: 3



ACTIVITY: D  
SITE TYPE: 16  
DATE OF ORIGIN: 1870  
CADASTRAL LOCATION: T-13S, R-4E, Sec. 4,  $\frac{1}{4}$ -NE  
LOCATION REFERENCE: Northwest of Warlock Mine along Warlock Road leading northwestward.  
DESCRIPTION: Relocated by W.J. Hastings in November of 1888 (Book E, p. 417).

#### PADLOCK MINE

CLASS: 3  
ACTIVITY: D  
SITE TYPE: 16  
DATE OF ORIGIN: 1870  
CADASTRAL LOCATION: T-13S, R-4E, Sec. 3,  $\frac{1}{4}$ -NW  
LOCATION REFERENCE: Northwest of Cincinnati Belle Mine. Southwest of Warlock Mine.  
DESCRIPTION: Rediscovered in 1888 by Chas. H. Bacon (Book E, p. 372). Previously known as the St. Petersburg Mine. Worked through 1928 (Book G, p. 334, 338, 358, 394, 410, 583, 744; Book I, p. 23, 58, 112-113). Today tailings and burned areas, possibly where structures once stood, remain.

#### READY RELIEF MINE

CLASS: 3  
ACTIVITY: D  
SITE TYPE: 16, 17, 18, 20, 21, 22  
DATE OF ORIGIN: August 30, 1870  
CADASTRAL LOCATION: T-13S, R-4E, Sec. 10,  $\frac{1}{4}$ -NE  
LOCATION REFERENCE: Foot of Chariot Canyon, south of Banner Grade.  
DESCRIPTION: Discovered by D.D. Bailey, A.W. Julian, founders of Julian, and J.O. Bailey, J.M. Bailey, A.B. Woods, and G. Edgerton (Book A, p. 200). Rediscovered in 1888 by D.D. Bailey and J.O. Bailey (Book E, p. 350). Redman Mine is located across the road and mention is made of an arrastre in the middle of the dirt road between the two mines. The Ready Relief is again assessed for work in 1919-1922. The mines in the complex include the Antelope, Hidden Treasure, NW Redman, Redman, the Hubbard, Poor Man, Belmont, Tom Paine, Raindrop, and Mountain Mines (Book H, p. 197, 219, 238). A mill site is mentioned in 1922. Today a stream runs through the mill site. Little of the mill equipment is left. One small wooden cabin with a stone chimney stands in the small canyon. This cabin was built in the early 1870's and served the mine in boom days, later becoming the mess shack. Several other houses and shacks were also built in the 1870's but were destroyed by a fire in 1938. One of the Bailey homes in the area was demolished in the 1880's and another was built on the site by a man named Neihart who owned the land for some time. In 1881-1909, Luther Bailey lived across the creek in a structure. The cabin remaining today has paned



windows, is painted green and has an asphalt composition roofing. Some recent equipment is scattered on the site such as a bulldozer, fencing material, etc. Another more recent small wooden cabin (shack) sits at the mouth of the canyon, near Highway 78. It is painted red.

#### REDMAN MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: September 2, 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 10,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: West of Ready Relief Mine, across the creek.

DESCRIPTION: The first mine discovered in the Banner area by L. Redman, et.al. (Book A, p.191). Mill site located the following day (p.192). Redman Tunnel, Redman Ledge #2, Redman Extension, and Redman West Extension were located within the next week (Book A, p.172, 177). Since the Redman Mine and the Ready Relief were essentially joined when the Ready Relief put in their mill, the same description for the Ready Relief applies to this site.

#### SHAMROCK MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: October 7, 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 3,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: West of Madden and Antelope Mines on slope of mountain over Warlock Road.

DESCRIPTION: Discovered by John Madden, the Shamrock was a part of the Madden Mines (Book A, p.10). The Shamrock north was located by L.B. Hopkins, et.al. in May of 1870 (Book A, p.11).

#### WARLOCK MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 17, 18, 19, 20, 21, 22

DATE OF ORIGIN: October 7, 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 4,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Southwest of Banner Grade along the Warlock road/trail. Northwest of Madden Mines.

DESCRIPTION: Discovered by George McKean, W. Heresy, M. Coin, R.D. Burows, J. Daily, J. Ward, and B.H. Freeman (Book A, p.226). Relocated in 1888 by Chas. H. Bacon (Book E, p.175). In 1893 by B.F. Simmons. In 1906 Warlock #3 was located by John R. Taylor (Book G, p.572). Warlock Tunnel Site located in 1906, southeast of the Chaparral Blacksmith Shop, located at the Warlock (Book G, p.574).



1907: Proof-of-labor for Chapparal, Warlock, Warlock #2-#7, Golden Shamrock, and the Mill Site (Book G, p.610-616). 1921: relocated by Thomas Strick, L.A. Smith. Julian and Banner wagon road crosses and recrosses ledge near SE end of claim. At this site, a good deal of the original mining equipment and structures remain. 5-6 corrugated tin shacks with wooden beams and floorboards, poured concrete foundations remain. Iron metal fixtures remain in some of the structures. Heavily vandalized, furniture and equipment lies in the canyon below. One structure on the south side has a 6' high concrete foundation with a wooden structure with a corrugated tin roof and sides. A wooden table lines one wall. A concrete storage area lies below the floor of the wooden structure. This is possibly the blacksmith shop. The mill remains intact on the property though highly vandalized.

#### GOLDEN GEM MINES

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: 1912

CADASTRAL ACTIVITY: T-13S, R-4E, Sec. 4,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: West of Bedrock Mine, northwest of the Warlock.

DESCRIPTION: Discovered by D.F. Lane on February 5, 1912. Golden Gem #1 (Book G, p.717); Golden Gem #2 (Book G, p.718). Nothing remains of the mines except some tailings.

#### A-BAR-A-RANCH-A

CLASS: 2

ACTIVITY: B

SITE TYPE: 06, 32

DATE OF ORIGIN: 1900's?

CADASTRAL ACTIVITY: T-12S, R-4E, Sec. 33,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: East of Banner Grade, about halfway between Julian and Banner.

DESCRIPTION: Probably a turn-of-the-century working ranch, the property is still occupied and used as a ranch. It consists of a main ranch house--wooden with asphalt composition roofing. Several small wooden shacks surround the house. One shack is tin with a small corral for cattle. A windmill also lies on the property. Several recent trailer-type structures sit on the property. The property is now owned by the Allens. Further down the canyon to the southeast lies an earth reservoir, and further southeast is a small deserted wooden shack with a corrugated tin roof and a cobble stone ledge surrounding the structure.

#### Non-Visited Sites

##### LOPEZ HOMESTEAD

CLASS: 3



ACTIVITY: B

SITE TYPE: 04, 06

DATE OF ORIGIN: 1870's

CADASTRAL LOCATION: 13S, R-4E, Sec. 1, ¼-SW

LOCATION REFERENCE: South of Banner Grade, Highway 78

DESCRIPTION: From 1870 to 1895, the Lopez Homestead flourished as a cattle ranch. On the property was an adobe house, a barn and a corral, along with orchards, vineyards, and a garden. Gold was discovered on the property in 1895 (See Ranchito Mine) and the ranch declined.

#### AGUAJITO (AGUALITO) MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: May 21, 1895

CADASTRAL LOCATION: T-13S, R-4E, Sec. 11, ¼-NW

LOCATION REFERENCE: South of Banner Grade, north of Rodriguez Spur Truck Trail.

DESCRIPTION: Discovered shortly after the Ranchito Mine on the Lopez Homestead, this mine was worked for a few years but was not as prosperous as the Ranchito. Discovered by Francisco Lopez and Santillanes (Julian Mining Claims Book G, p.230). No structures.

#### BANNER QUEEN MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: October 6, 1917

CADASTRAL LOCATION: T-13S, R-4E, Sec. 1, ¼-SE

LOCATION REFERENCE: South of Highway 78

DESCRIPTION: Etta Downs filed a claim on the Banner Queen Mine in 1917, but it is possible that it was discovered before that date. The Banner Queen trading post was named after the Mine (County Mining Claims Book 49, p.206).

#### DESERT QUEEN MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16, 22

DATE OF ORIGIN: March 22, 1934

CADASTRAL ACTIVITY: T-13S, R-4E, Sec. 12, ¼-SE

LOCATION REFERENCE: South of Banner Queen Mine, east of Rodriguez Spur Truck Trail.

DESCRIPTION: H.W. Maddox filed for the mine in 1934 (County Mining Claims Book 284, p.194). Desert Queen Mines #1-#15 were dis-



covered in the following months by E.P. Barclay and Stephen E. Taylor (Book 358, p.103, 105; Book 352, p.28, 333, 361; Book 369, p.41-43, 240-242, 364).

#### ELDORADO LEDGE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16, 21

DATE OF ORIGIN: April 13, 1870

CADASTRAL LOCATION: T-12S, R-4E, Sec. 33

LOCATION REFERENCE: Southwest of Banner Grade

DESCRIPTION: Also known as the Ella Mine Group, Eldorado Ledge was filed by Wm. Moran, Jeremiah McCarthy, Eugene Kelly, Michael Lane, Michael Conners, Goerge Phelps, and Francis Sullivan (Julian Book A, p.91). Relocated April 1888 by S. Wilcox (Book E, p.383). Relocated by Chas. Bacon, September 1888 (Book E, p.449). 1917, relocated by E.F. Bowen (Book I, p.59). Mill constructed by E.F. Bowen in 1915 (Book H, p.26).

#### ELEVADA MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: 1895

CADASTRAL LOCATION: T-13S, R-4E, Sec. 11,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: South of Banner Grade, Highway 78, north of Ranchito and Agualito Mines

DESCRIPTION: Discovered shortly after the Ranchito Mine on the Lopez Homestead, this mine was worked for a few years but not as prosperous as the Ranchito.

#### ELLA MINE GROUP

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: July 14, 1870

CADASTRAL LOCATION: T-12S, R-4E, Sec. 33,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Southwest of Banner Grade

DESCRIPTION: Discovered by Jao. Estudillo, W.J. Woodwerce, D. Coy-orce, C. Phillips, Wm. Fletcher (Book B, p.43). NW extension filed by Wilcox (Book E, p.281). 1896, South Ella Mine filed by L.L. Wilcox and F.E. Farley (Book G, p.260).

#### FRIDAY MINE

CLASS: 3

ACTIVITY: D



SITE TYPE: 16

DATE OF ORIGIN: 1870's

CADASTRAL LOCATION: T-13S, R-4E, Sec. 15, ¼-SW

LOCATION REFERENCE: East of Highway 79

DESCRIPTION: Probably discovered in the 1870's, the Friday Mine was open in 1889, filed by R.W. Shaw (Book I, p.420). Located 1000 feet north of the Mason Log Cabin.

#### GOLD KING MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 03

DATE OF ORIGIN: 1888

CADASTRAL LOCATION: T-13S, R-4E, Sec. 15, ¼-SE

LOCATION REFERENCE: East of Highway 79, 4 miles southeast of Julian

DESCRIPTION: Located by Joseph E. Hamilton, R.G. Melrose, and F.E. Feeler. There were structures for the foreman, miner's families, a bunk house and mess hall in the 1890's. Ore was hauled to Banner for milling. The mines closed in the early 1900's and nothing of the structures remain today.

#### GOLD QUEEN MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 03

DATE OF ORIGIN: 1888

CADASTRAL LOCATION: T-13S, R-4E, Sec. 15, ¼-SE

LOCATION REFERENCE: East of Highway 79, 4 miles southeast of Julian

DESCRIPTION: Same as above. The Gold Queen was an extension of the Gold King.

#### HELVETIA MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 17, 21, 22

DATE OF ORIGIN: August 4, 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 4, ¼-NW

LOCATION REFERENCE: Southwest of Banner Grade, 1 mile southeast of Julian

DESCRIPTION: Discovered by Sebastain Southernier, Solomon Shulz, and George Yost (Book A, p.171), the Helvetia Group consisted of the Hassayampa, Helvetia, Grand Central, Rico Aspen, Anaconda, Portland, Denver, and Hillside Mines. A stamp mill was set up in 1898, reduction works were built in 1900 to handle 50 tons of ore per day. Today the mine is deserted and no equipment remains on the property.



#### KENTUCK LEDGE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: May 26, 1871

CADASTRAL LOCATION: T-13S, R-4E, Sec. 3,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Southwest of Banner Grade, west of Banner

DESCRIPTION: Mining claim filed by P. Shelly, G. McKean, Wm. Kearsey (Book C, p.15; Book D, p.45). Claim for Kentucky #2 was filed at the same time. The mines were owned in 1881 by S.A. McDowell (Book E, p.185); 1883 by C. Holloran (Book E, p.203); 1923 by R.G. Melrose (Book H, p.270-272); and 1928 by Chas W. Curry (Book I, p.105). No structures known to remain on the site.

#### KING LEDGE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: May 26, 1871

CADASTRAL LOCATION: T-13S, R-4E, Sec. 14,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Northern extension of the Golden Chariot

DESCRIPTION: Claimed in 1871 by Joseph Coyne, G.V. King, Richard Conners, J. Lang, and D. McSellan (Book C, p.2, Book D, p.27). Extensions claimed in the same year by Austin Chambers and Chester Gunn (Book C, p.3, 6; Book D, p.74, 33, 43). No known structures exist at this mine.

#### QUEEN LEDGE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: January 23, 1872

CADASTRAL LOCATION: T-13S, R-4E, Sec. 14,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Extension of the King Ledge near the Golden Chariot

DESCRIPTION: Claimed by A.P. Frary, J. Denman, A.W. Whitney, et.al. (Book C, p.48, Book D, p.91). Claimed by Wm. Woodrow in August of 1888 (Book E, p.412).

#### MAJESTIC MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16, 21

DATE OF ORIGIN: September 29, 1924

CADASTRAL LOCATION: T-12S, R-4E, Sec. 32,  $\frac{1}{4}$ -SE  $\frac{1}{4}$  of SE

LOCATION REFERENCE: South of Banner Grade, east of Julian, 600 ft.



north of San Diego Mine

DESCRIPTION: Located by John A. Paulson (Book I, p.19). To the north, Majestic #1 was located by Joe P. Martin (Book I, p.17). Mines were worked 1925-1929. No known structures remain on the property.

#### NORTH STAR LEDGE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: April 16, 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 12,  $\frac{1}{4}$ -E  $\frac{1}{2}$  of SW

LOCATION REFERENCE: South of Banner Grade, east of Rodriguez Spur Truck Trail. Located east of Ranchito Mill.

DESCRIPTION: Discovered by Wm. Moran, Joseph Marshay, John Bush, Wm. Thompson, A. Gebhardt (Book A, p.110). Relocated by James W. Sanders in July of 1926 (Book I, p.73). Worked 1927-1928. No known structures exist now.

#### RANCHITO MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 10, 17, 21

DATE OF ORIGIN: June 1895

CADASTRAL LOCATION: T-13S, R-4E, Sec. 11,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: South of Banner Grade, northeast of Rodriguez Spur Truck Trail on Lopez Homestead. Located on the west side of a spur of Granite Mountain.

DESCRIPTION: The last important gold-bearing deposit to be developed in the Julian district, the mine was discovered by Leandro Woods, a vaquero on the Lopez Homestead. The property was bought by Cave J. Coutts, Jr. in September 1895. He erected buildings and a mill on the site. The mine closed in 1897 and was not reopened until 1924 by Howard Bailey and R.G. Melrose--the North Ranchito. Reportedly, remains of a small wooden shack are on the property, but no equipment.

#### SAN DIEGO MINE

CLASS: 3

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: February 28, 1870

CADASTRAL LOCATION: T-13S, R-4E, Sec. 3,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Southwest of the Helvetia Mine, east of Julian

DESCRIPTION: Discovered by F.N. Caulkins (Book A, p.23). San Diego #1 was discovered by John P. Chambers in April 1870 (Book A, p.72).



No known structures now exist at the mines.

L.N. BAILEY RANCH

CLASS: 3

ACTIVITY: B

SITE TYPE: 06, 10

DATE OF ORIGIN: Early 1900's?

CADAstral LOCATION: T-13S, R-4E, Sec. 3, ¼-NE

LOCATION REFERENCE: East of the Madden Mines, across Banner Grade

DESCRIPTION: Mention is made of the ranch in a 1921 mining document. Probably a turn-of-the-century working ranch.



### Oriflamme-Vallecito/Canebrake

Because of the geographical proximity and historical similarity of the Vallecito/Canebrake and Oriflamme sections, these two areas are combined in this part of the report. One major factor influenced the history of this desert area east of the Laguna Mountains in San Diego County: the transportation route which intersected much of the desert valley territory-the Old Overland Stage Route, now known as County Highway S-2. Discovered by Pedro Fages on a trip to the Colorado River in 1772, the Oriflamme Canyon-Vallecito Valley-Carrizo Valley route would serve as a major transportation passage for explorers, fur trappers, the military, and mail and stage companies. It would play a significant role in the history of Southern California as well as in the shaping of historical events in the surrounding area.

The location of water resources also shared in determining settlement patterns of the area as well as the direction of the transport route. The cienega (marsh) in Vallecito Valley was the location of a stage station in the 1850's, and would later serve as a watering area for cattle driven to California along the desert route. A small sod-brick house was built for military use on the site by James R. Lassiter in 1851 during the Garra Indian Revolt (Journal of San Diego History V, 1:17). In later years, the house was enlarged to serve the weary travelers on the stage lines. The structure was abandoned after the stage services ceased, and fell to decay. In the 1930's, the station was reconstructed and restored by Dr. and Mrs. Louis Strahlmann of San Diego with the help of Everett Campbell (of Campbell Ranch), John S. Siebert, architect, and Malcolm J. Rogers of the San Diego Museum of Man. The station and six acres surrounding it then became a County Park, donated by C.F. Holland of Los Angeles (Parker, p. 69). Robert Crawford (of Crawford Ranch in Canebrake Canyon) became first caretaker of the reconstructed station. The station is located approximately halfway between the Carrizo Station and the San Felipe Station, 18 miles south of State Highway 78 on County Highway S-2.

Palm Spring (SE  $\frac{1}{4}$  of SW  $\frac{1}{4}$ , Section 25, T-14S, R-7E), once an oasis surrounded by palm trees, stands east of Canebrake, approximately halfway between the Carrizo and Vallecito Stations (Journal of San Diego History IV, 2:15; V, 1:26). Though bypassed by many of the early explorers, the oasis was used by the Mormon Battalion on their trek through the desert, and later, in the nineteenth century and early twentieth century, it served as a watering place for the many cattle drives traversing this area. Efforts have been made to replant the destroyed palms (travelers cut them down for fuel); however, the site now stands as a rather desolate reminder of the past. The spring which fed the area has since gone dry and only one or two palms remain (Dixon 1958).

Box Canyon, near the northern boundary of the study area,



is now a historical monument marking this famous pass of the Mormon Battalion. A narrow canyon, it would not yield to the wagons of the Battalion, and the men had to chop through the rock walls on either side in order to pass through. The Mormons are credited with making the first wagon trail to Southern California by this route.

The stage lines (Birch and Butterfield) ceased to operate at the beginning of the Civil War in 1861, and the road was once again known as the Southern Emigrant Trail (see Tables for details on the Overland Route). In 1861, Confederate forays made their way down the trail, infiltrating California as well as Arizona and New Mexico. It was at this time that the "Army of the Pacific," or the California Volunteers was formed to defend the three areas. A camp was set up at Oak Grove (Camp Wright) and Fort Yuma was also used as a base of operations. Supply depots were established at San Felipe, Vallecito, and Carrizo stations. A military mail was set up along the Overland Route and cattle drives through the area provided food for soldiers.

By the twentieth century, much of the route had been abandoned in favor of more northern routes. The railroad never went through and the route was used mostly for cattle drives and as access to the few ranches on the desert land. By World War II, the route was virtually forgotten. In December of 1941, the Anza-Borrego State Park was dedicated, and work was begun to restore and preserve several landmarks along the route indicative of its early history.

The Overland "Gateway Corridor" leads from the site of the Carrizo State Station in the south, through Carrizo Wash, to Vallecito Valley. The route then passes into Upper Vallecito or Mason Valley. From Mason Valley, the route forks. Pedro Fages as well as the San Antonio-San Diego ("Jackass Mail") Stage traveled from Mason Valley up through Oriflamme Canyon and on to San Diego, while the wagon road turned and entered Box Canyon to Blair Valley. At the northern end of Blair Valley, the route passed over a steep and rocky incline (dubbed "Foot and Walker Grade" because one had to walk over the pass) and dropped into the San Felipe Valley.

One of the early pioneers in the study area of Mason Valley, Vallecito Valley, and Canebrake Canyon was James E. Mason, after whom Mason Valley was named. He was in the valley as early as 1857 when the first Overland mail arrived in the valley. He was in charge of the California end of the Birch mail route; the first mail arrived on August 31, 1857 (Journal of San Diego History XV, 2:17). In the 1860's, Mason filed for land at Vallecito and lived in the old Butterfield Stage Station (Patent Book #3, p. 341: for the NE  $\frac{1}{4}$  of Sec. 10, T-14S, R-6E). A drought in 1869-70 dried up the cienaga, Mason's source of water supply, and forage for his cattle became scarce



in the valley. Mason then filed for land in the next valley to the northwest which would later bear his name as the first settler in the area. The Masons lived in the valley and built several adobes on their homestead (see Mason Homestead in Tables). Their 160-acre homestead was finally granted to them by the United States government in November of 1891 (Patent Book #9, p. 13: for the N  $\frac{1}{2}$  of SE  $\frac{1}{4}$ , SW  $\frac{1}{4}$  of NE  $\frac{1}{4}$ , SE  $\frac{1}{4}$  of SE  $\frac{1}{4}$ , Section 12, T-14S, R-5E). At one time, two thousand head of cattle belonging to Mason roamed both the Mason and Vallecito Valleys. Another drought in the years 1895-1904 ruined the area for cattle grazing and drove the Masons out of the valley.

The Campbells of Vallecito Valley were another pioneering family (see Campbell Ranch in Tables). Everett W. Campbell and his wife Lena pioneered the first large-scale desert ranch in Vallecito Valley. A native of Colorado, Everett had worked for George McCain in cattle-ranching and, in 1905, he met and married George's daughter, Lena McCain. The two settled in Vallecito Valley in March of 1916, hauling material for their ranch house down Banner Grade by mule. The dry desert homestead was soon converted into an oasis of green pasture and fruit trees (they raised apricots). Fourteen gravity springs were developed and in the 1930's, a costly water system was constructed which entailed a pipe-and-ditch line from Mason Valley over the hill to Vallecito Valley. It cost the Campbells \$10,000 to build the ten inch wide pipe and cement ditch system (South 1939:25-27, 39). The Campbells' skillful use of their water resources was one of the main reasons for their ability to survive as cattle ranchers in such a dry land. The water from the pipeline was pumped into an earth reservoir at the entrance to the ranch, and used to irrigate alfalfa and water the cattle (Union 3/24/55).

The Campbells engaged in dairying on their ranch until 1933. Their main concern was cattle ranching and alfalfa was grown to feed the cattle. Everett Campbell was also an expert horseman and had his own smith shop on the ranch. In 1936, the Campbells assisted in the restoration and preservation of the Vallecito Stage Station. Everett Campbell is also responsible for the introduction of the Brahma bull into the desert and he developed a cross with the Hereford that produced a hardy breed of cattle of superior beef quality. He was also responsible for the ranch being included as a game refuge under the protection of the fish and game commission. The Campbells were active in community affairs and attended many functions in Julian. In 1948, their original ranch house was burned to the ground and in subsequent years, a large modern home was built over the original site.

In 1951, the Campbells had retired and left the desert to do some traveling. Their ranch house and pastures still stand today as a reminder and landmark of early ranching days in the desert. In 1955, the ranch entailed 5,572 acres and was



purchased by Mrs. Catherine Spencer of Guatay. The ranch then became known as Rancho Vallecito instead of Campbell Ranch. Catherine Spencer died in 1975 and in 1978, Rancho Vallecito was sold to Wayne Hoffman of Los Angeles for \$500,000. Cattle and horses are grazed on the land seasonally.

In 1910, the Imperial Valley was becoming the primary feeding ground for cattle, since the cattle could be fattened up there on the good grazing land in the winter and prices were better on the winter market. Cattle were driven through the Mason, Vallecito, and Carrizo Valleys in great number. Cattlemen also began to use the Mason, Vallecito, and Carrizo Valleys as winter grazing grounds. Ralph Benton and Archie Chilwell were two of the main cattle drivers in Vallecito Valley. Bertram Moore and George McCain used Mason Valley and Bob McCain frequented Canebrake Canyon, Carrizo Valley, and the Fish Creek area.

Also in the early 1900's, some prospecting was done in the desert areas. Men from Julian and Banner, such as Howard Bailey, set out to find more gold after their Julian/Banner mines declined in production. An interest in oil wells in the desert was also developed at this time. Prospectors representing the Carrizo Creek Oil Company, Palm Spring Oil Company, Vallecito Oil Company, Cactus Oil Company, Mesquite Oil Company, and Yuha Oil Company, all flooded the area.

In 1926-1930, more settlers came to the desert valleys, most of them staying just long enough to prove their homesteads. To receive title to a piece of property, the homesteader was required to spend six months a year, for three years, on the property and to make property improvements. This accounts for many of the small wooden structures scattered throughout the valleys (see Tables). They were occupied temporarily and at the end of the three year period, they were usually abandoned. The homesteaders received the land for future investment.

In 1934, the Taylor Grazing Act was passed which authorized the leasing of certain unreserved lands to cattlemen. Robert and Grace Crawford were to make use of this Act to establish their cattle ranch in Canebrake Canyon, or "Rainbow Valley" as they called it, south of present-day Agua Caliente Springs. Canebrake Canyon leads approximately three miles southwest from Laguna Mountain Spring to the desert near Palm Spring. The Canyon was so named because of the abundance of canebrake growing in the canyon.

The Crawfords moved to their locked-in desert valley in 1933-34. They forged the road up the canyon, carting their supplies for the building of the ranch. The canyon was watered by spring-fed brooks and the Crawfords proceeded to raise livestock and grow alfalfa for them on the fields surrounding their ranch house. The Crawfords remained on their ranch for many



years, and Robert Crawford also served as caretaker of the Vallecito Stage Station when it was restored. The Crawfords are a rare example of ranchers who could survive in the desert by skillful use of scarce water resources available. They raised cattle until 1975 when the ranch was sold to Pete Marston. Cattle are now grazed seasonally on the ranch in the winter. Rock and concrete ditches run down the canyon, probably built to direct water into storage areas. Flood waters in the past decade have ruined a good deal of the pasture land and the canyon below. In 1969, the canebrake in the canyon was burned for water clearance (Union, 12/28/69).

In the years 1939-40, the assessed value of land in the Carrizo and Vallecito Valleys was from \$.45 to \$.80 per acre (Journal of San Diego History XIX, 4:22-23). A 1940 census lists three families in the whole area: Robert Crawford of Canebrake Canyon, Marshall South of Blair Valley, and Everett Campbell, the only man in the area with land under cultivation. People owning the land in the area had purchased it as an investment and did not live there. Bringing water to the areas was impractical and too costly in most cases.

Just after World War II, a number of parcels of land were made available to the public by the government. The area south of Agua Caliente Springs (now known as Canebrake) was one of the areas set aside for these "Jackrabbit Homesteaders" (Parker 1963:69). Five-acre parcels were sold to people hoping to make the area their desert retreat. Many retired citizens leased the land and several cabin-type structures were erected from the late 1940's to the 1960's. Mr. and Mrs. Tom Hays were pioneers of the community, retired from San Diego. Wells were drilled even though well water was poor (see Tables for more details). Most of the cabins are now occupied in the winter months and abandoned in the summer, although a few residents remain all year round.

The Canebrake community cabins and a trailer-camper park in Mason Valley, along with a few other scattered cabins and trailers, represent the retired desert residents of the valleys. The ranches mentioned earlier, however, were the main economic centers until the desert started being used for retreat and camping purposes.

The significance of the Oriflamme Canyon, Mason Valley, Vallecito Valley and Canebrake Canyon areas lies in the transportation route which determined the history and settlement of the areas. The route served early explorers, Mexican pioneers, mountain men, Kearney's Army of the West, Cooke's Mormon Battalion, the boundary commission, the Forty-niners, the railroad survey parties, the Overland Mail and stages, the California Legion and later the cattle drivers and homesteaders. Men built their homes in this area to serve the transport route as well as to use it. Cattle ranching is the primary economy of the region and camper parks today serve the transport route



much like the stage stations served early travelers. The Campbell Ranch, Crawford Ranch, and Mason Homestead are the most significant examples of the harsh conditions under which cattle ranching was carried out. The families learned to adapt to the desert and have survived and produced effectively because of this adaptation. Even the ranch owners were not exclusively concerned with their own cattle ranching; they served the transport route by participation (Mason with the Birch Mail) and preservation (Campbell and Crawford with the Vallecito Stage Station). Most of the historical significance of the area can be attributed to the transportation route and the three major cattle ranches are mentioned in this report.



Oriflamme-Vallecito/Canebrake

ORAL INTERVIEWS

| <u>DATE</u>                                                                                                                                              | <u>INTERVIEWEE</u>        | <u>LOCATION</u>                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------|
| June 24, 1979                                                                                                                                            | Stafford Shaw             | Butterfield Ranch Trailer Park, County Highway S-2 in Mason Valley          |
| Owner of the Butterfield Ranch Trailer Park. Has lived in the area for several years. Trailer park was started in the 1950's.                            |                           |                                                                             |
| June 24, 1979                                                                                                                                            | Clifford Kimball          | Butterfield Ranch Trailer Park, County Highway S-2 in Mason Valley          |
| An "old-timer" in the area, Mr. Kimball takes people into the surrounding desert area to explore old sites. He is retired and lives at the trailer park. |                           |                                                                             |
| June 24, 1980                                                                                                                                            | Robert and Grace Crawford | Crawford Ranch, Canebrake Canyon, Canebrake, south of Agua Caliente Springs |

The Crawfords pioneered the Crawford Ranch in Canebrake Canyon. The Crawfords no longer live permanently at the ranch as it has been sold, but do live there temporarily in the winter months. Have lived in the area since 1934.



## Historical Sites--Oriflamme-Vallecito/Canebrake

### Visited Sites

#### ORIFLAMME CANYON WATER STORAGE SILOS (2)

CLASS: 5

ACTIVITY: B

SITE TYPE: 34

DATE OF ORIGIN: 1910-1930's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 8,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Located on the western slope of Oriflamme Mountain, approximately  $\frac{1}{2}$  mile east of County Highway S-1. The storage tanks are located near a dirt trail which runs along the mountains and into Oriflamme Canyon.

DESCRIPTION: The two water storage silos are made of tin. Probably no longer used, the silos served as water storage for cattle drives leading from the mountains to the deserts in the cattle grazing seasons.

#### MASON VALLEY RANCH HOUSE

CLASS: 5

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1940's-1950's

CADASTRAL LOCATION T-14S, R-5E, Sec. 2,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located immediately to the west of County Highway S-2, less than  $\frac{1}{8}$  of a mile from the road in Mason Valley.

DESCRIPTION: The ranch complex consists of a one-story, concrete block house structure with screened patio. The roof is of tin. A windmill and water storage tank are on the property as well as several small corrals and a wooden utility shed. A cement slab may have been the foundation for an earlier ranch house. Oleander grows on the property. Probably used temporarily in winter cattle grazing months, it was abandoned at the time of our visit. Temporary trailers and a camper with sheds sit directly across the County Highway across from the ranch house.

#### BOX CANYON RANCH

CLASS: 6

ACTIVITY: B

DATE OF ORIGIN: 1920's-1930's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 2,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: 15035 County Highway S-2. East of the Highway. Dirt road leads into the ranch.



DESCRIPTION: Ranch house complex consists of three structures: one wooden with half-destroyed tarpaper roofing; one more recent formed concrete with no roof; one wooden shack with tin roof. Electric lines run to the complex. Cattle were once grazed on the valley land surrounding it, but now abandoned.

#### MAURER AND ROLLO RANCH HOUSE

CLASS: 5

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1970's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 2,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located southeast of Box Canyon Ranch on a dirt road leading from County Highway S-2 on the east side of the Highway.

DESCRIPTION: One modern wooden ranch house. Some grazing may be done seasonally from this ranch. Ranch house is in good condition and inhabited. Electric lines run to the house.

#### FRANK STEPHENS' GRAVE

CLASS: 5

ACTIVITY: B

SITE TYPE: 30

DATE OF ORIGIN: 1937

CADASTRAL LOCATION: T-14S, R-5E, Sec. 2,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located to the north side of the dirt road leading to the Maurer and Rollo ranch house. East of County Highway S-2.

DESCRIPTION: A three-foot high stone and concrete marker holds a bronze plaque and marks the grave of Frank Stephens, 1849-1937. Stephens was a noted naturalist in San Diego County. He helped establish the San Diego Zoo in 1916 and became its first director. Stephens also served as a curator of the San Diego Natural History Museum for many years. In the 1890's, Stephens lived at Ballena. Also in the 1890's, Stephens and W.J. Fenn, an artist, were preparing a book called "Birds and Mammals of California." Later, in the 1930's, Stephens lived in San Diego. He was killed in October of 1937 after being hit by a street-car (San Diego Union 10/16/1893, 5:3; 1/25/1894, 5:2; 10/6/1894, 5:2; 11/6/33, 1:3; 11/6/33, 1:6; B 7/4/71, 2:4-8).

#### COTTONWOOD CANYON BEE HIVES

CLASS: 5

ACTIVITY: B

SITE TYPE: 34

DATE OF ORIGIN: 1960's-1970's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 15,  $\frac{1}{4}$ -NW



REFERENCE LOCATION: Located at the base of the Sawtooth Range and at the base of Oriflamme Mountain in Cottonwood Canyon near dirt trails or washes leading into the canyon. Southwest of County Highway S-2.

DESCRIPTION: Two bee hive colonies were located, each with approximately 20 to 30 white wooden hive boxes. The hives are probably cultivated by owners of ranches in Mason Valley.

#### COTTONWOOD CANYON CORRAL

CLASS: 5

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1920's-1930's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 10,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located along dirt trail (wash) leading up into Cottonwood Canyon. At the base of Oriflamme Mountain approximately 2-3 miles from County Highway S-2.

DESCRIPTION: The corral probably served as a holding pen for cattle in the winter grazing season. Cattle were driven up Cottonwood Canyon to graze.

#### BUTTERFIELD RANCH TRAILER PARK

CLASS: 5

ACTIVITY: B

SITE TYPE: 02

DATE OF ORIGIN: 1950's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 1,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located in Mason Valley, immediately to the south of County Highway S-2.

DESCRIPTION: This green oasis in the dry Mason Valley serves as a permanent trailer park and as a campground to desert travelers. Watered by a well, the oasis consists of a store complex with a gas station and cafe. Permanent trailer residences sit under tall shade trees. Several swimming pools sit on the property. An airstrip with operation trailers stands on the north side of the Highway directly across from the trailer park.

#### WOODEN SHEDS AND BEE HIVES

CLASS: 6

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1930's-1940's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 1,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located to the northwest of County Highway S-2 on the west side of Campbell Grade.

DESCRIPTION: Three wooden sheds, two of which appear to be out-house type structures with a small colony of bee hives sit to



the northwest of the Highway. Probably used in earlier 1900's, now abandoned.

#### CAMPBELL GRADE

CLASS: 5

ACTIVITY: E

SITE TYPE: 25

DATE OF ORIGIN: 1916-1970's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 1,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Now a part of County Highway S-2, leading from Mason Valley southeast into Vallecito Valley over a range of hills.

DESCRIPTION: Campbell Grade received its name in the 1920's after the Campbell family which homesteaded in the upper Vallecito Valley in 1916 (see Campbell Ranch). The grade out of Vallecito Valley into Mason Valley was so steep on the east side that when Mrs. Campbell drove her Model-T up it, her husband would have to pull the car up the grade by horse and lariat (Union 3/24/55).

#### CAMPBELL RANCH (RANCHO VALLECITO)

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: March 1916, 1948

CADASTRAL LOCATION: T-14S, R-5E, Sec. 12,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located approximately  $\frac{3}{4}$  mile from County Highway S-2 on a dirt road leading southwest from the Highway. Upper Vallecito Valley, at the base of Sawtooth Hills. Address: 33925 County Highway S-2.

DESCRIPTION: Mr. and Mrs. Everett W. Campbell pioneered this ranch in upper Vallecito Valley in 1916. It was the first of its kind--a large scale desert ranch. Material for the ranch house was brought down over Banner Grade by mule. In 1948, the original ranch house burned to the ground. A large modern home was erected over the original site. A dairy and cattle grazing ranch, it prospered. Alfalfa was grown in fields which still stand today. Water was brought in by way of a system which was built by Everett in the 1930's--a pipe and ditch system from Mason Valley to Vallecito Valley. The water was pumped into a reservoir on the property. Today the reservoir can be seen at the entrance gate to the ranch houses, although it is now dry. The ditch running over the pass in the hills to Mason Valley can also be seen. Fruit trees (apricots) still line the property near the ranch houses. The original ranch house complex had a small smith shop. By 1955, the ranch contained 5,572 acres. By 1951 the Campbells had retired and left the desert. In 1955 the ranch was sold to Catherine Spencer. In 1963 a project entailed the levelling of 55 acres for irrigation



to graze cattle. The ranch was sold in 1978 to Wayne M. Hoffman of Los Angeles for \$500,000. He owns the house today. Cattle and horses are grazed on the pasture land south of the reservoir. A path near the pasture is also used as a landing strip. The pasture is surrounded by trees and five palm trees stand above the rest. Several structures remain on the ranch house area. Old equipment and water troughs are scattered over the property. There are several corrals and wooden sheds. Two of the ranch house structures have tin roofs. There is one wooden structure and also a large wooden frame structure--possibly remnants of a barn. The Campbell Ranch is now known as Rancho Vallecito.

#### STORM CANYON, SOUTHWESTERN VALLECITO VALLEY BEE HIVES

CLASS: 5

ACTIVITY: B

SITE TYPE: 34

DATE OF ORIGIN: 1960's-1970's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 26,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located on a dirt trail leading towards the Laguna Mountains in the southwest extension of Vallecito Valley leading up to Storm Canyon. Located approximately 6 miles inland from County Highway S-2.

DESCRIPTION: The white bee hive boxes sit at the base of the Laguna Mountains on the valley floor. Probably belong to the Campbell Ranch (Rancho Vallecito) as a road leads to the ranch from the boxes.

#### THE POTRERO BEE HIVES

CLASS: 5

ACTIVITY: B

SITE TYPE: 34

DATE OF ORIGIN: 1960's-1970's

CADASTRAL LOCATION: 14S, R-6E, Sec. 29,  $\frac{1}{4}$ -SE  
Sec. 33,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Located along dirt trails which lead into the Potrero from Vallecito Valley. The boxes are located 5-6 miles inland from County Highway S-2.

DESCRIPTION: 20-30 white boxes sit in both colonies. Probably also belong to Campbell Ranch as a road leads from the ranch to the boxes.

#### CANEBRAKE COMMUNITY

CLASS: 5

ACTIVITY: B

SITE TYPE: 02

DATE OF ORIGIN: 1940's-1960's



CADASTRAL LOCATION: T-14S, R-7E, Sec. 34,  $\frac{1}{4}$ -SE, NE, SW

LOCATION REFERENCE: Located to the west of County Highway S-2, southeast of Agua Caliente Springs.

DESCRIPTION: The community entails 50-75 residences. Most of the residents are retired and live at the community seasonally. Some residents live there all year round. There are no stores, gas stations, etc., only residences. In 1961, the community had 50 residents and by 1964 was known as a "small city" which had sprung up near one of the county's original cattle-grazing areas. Mr. and Mrs. Tom Hays, retired from San Diego, were the pioneers of the community. They came to the area in the 1940's and by 1949, their small tract lease was approved. Several dirt trails wind through the town, connecting the small residences. In 1961, the residents of Canebrake were ordered by the County to stop taking water from wells and tanks of Agua Caliente Springs. Well water in Canebrake was poor. In 1968 a water system project was started. Today water is pumped by individual wells with windmills. A large number of the cabins are abandoned in summer months which indicates water is scarce. Residences include cabins of stucco, tin, wood, concrete block, rock and wood, and plywood. Electricity is brought in by electric lines although some generators are also used. A few of the residents names include: George and Pat Miller, Evan and Pearl Lile, the Mooney's, the Edmund's, the Leetches, and Ed and Polly List.

#### CANEBRAKE CANYON STRUCTURES

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1940's-1950's

CADASTRAL LOCATION: T-15S, R-7E, Sec. 3,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Located in Canebrake Canyon or Wash, which leads from the community of Canebrake up to Crawford Ranch. Approximately  $\frac{3}{4}$  mile from County Highway S-2.

DESCRIPTION: The Canebrake Canyon structures consist of several residences, similar in nature to those of Canebrake Community. Some are from the 1940's and others are more recent. Several trailers, wooden structures, and concrete brick houses line the wash on either side. Bill Stafford, the Schmidt's, the Whiteley's, the Potter's and the Roper's are residents in this area. Most are seasonal residents. In the 1940's, J.J. Sheridan leased a tract in the canyon on which he built a wooden house with a cook shack and an outhouse (Canyon File, SDHS). These structures remain today. An old rock and concrete one-foot wide ditch at the base of the mountain carried water eastward in earlier years. Today the wash is dry in the summer months. A rusted pipeline runs the length of the canyon along the road. A large, round steel water storage tanks also lie on the south side of the wash. Their use has been abandoned but



they were probably used in earlier years for water regulation and storage.

#### CRAWFORD RANCH

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1934

CADASTRAL LOCATION: T-15S, R-7E, Sec. 4,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Located at the mouth of Canebrake Canyon on the western slope of the Tierra Blanca Mountains. Canebrake Canyon leads about 3 miles southwest from near Laguna Mt. Spring down to the desert at Palm Springs area near Canebrake Community. It was so named because of the large number of canebrakes growing in the canyon.

DESCRIPTION: The Crawford Ranch house complex is located at the mouth of Canebrake Canyon in what the Crawfords call "Rainbow Valley." Robert and Grace Crawford came to the valley in 1934. They were the first in the area to make use of the Taylor Grazing Act of 1934 which authorized the leasing of certain unreserved public lands to cattlemen. They carted their supplies through the dense growth of canebrake in the canyon to the Rainbow Valley site. Their ranch house site consisted of a white main ranch house and another small structure. A small swimming pool also stood on the property. A new concrete ranch house has been built recently to replace the original one. Today it stands as well as another concrete block structure and several sheds. Several corrals and equipemnt lie on the property. Two landing strips lie to the rear of the structures on the west and southwest sides. A field also lies at this end of the property, in which alfalfa was once raised for cattle. A well with a windmill is the present source of water. A large palm tree stands at the entrance to the valley. A water storage tank, a trailer, tractors, and troughs are scattered about the property. An interview with the Crawfords revealed that the ranch was sold in 1975 to Pete Marston and he grazes cattle seasonally on the land. The Crawfords still visit the ranch in the winter months. Abandoned trailers lie further up the road in Canebrake Wash, a few miles to the rear of the Crawford Ranch.

#### COUNTY HIGHWAY S-2, OR THE OLD OVERLAND STAGE ROUTE

CLASS: 2

ACTIVITY: E

SITE TYPE: 25, 26, 27, 29

DATE OF ORIGIN: 1772 to present

CADASTRAL LOCATION: ----

LOCATION REFERENCE: The Old Overland Stage Route intersects the study area in various areas, mainly Mason Valley and Vallecito Valley. The route runs in a southeasterly direction



from Scissor's Crossing through Earthquake Valley, Box Canyon, Blair Valley, Mason Valley, Vallecito Valley, Agua Caliente Springs, Canebrake, and on into Carrizo Canyon.

DESCRIPTION: A major transportation route in Southern California history, the Old Overland Stage Route had its origins in 1772 when Pedro Fages and Anza made their explorations and expeditions to Sonora by way of Oriflamme Canyon and Carrizo Valley. In 1782, Fages described the Carrizo and Vallecito Valleys and Oriflamme Canyon in his diary. The route was commonly known as the Sonora Route at this time. In 1831, a party of North American fur trappers including J.T. Warner entered California and San Diego County by way of Carrizo and Vallecito Valleys. In 1832, Thomas Coulter, an English scientist, collected botanical specimens and made the first published map of San Felipe, Vallecito, and Carrizo Valleys. In the 1830's, Mexican courier routes were also set up in the valleys. In 1846, Kit Carson followed the route southward with dispatches from Fremont, met General Stephen W. Kearney and guided him and his dragoons back up through the desert route. In January of 1847, the Mormon Battalion passed along the route under Col. Phillip Cooke. They had wagons and are credited for blazing the first wagon trail to Southern California Box Canyon, north of the study area, as an example of their efforts to get the wagons through steep canyons. The trail then became known as the Southern Emigrant Trail as in the subsequent years, Mexicans, Sonorans, and Californians made numerous crossings along this route. In 1848, with the discovery of gold in California, migration over the road was heavy. 1849--Whipple Boundary Commission uses the trail.

In 1850, herds of sheep and cattle were driven to California from the east because of the mining boom. In 1853, the route was surveyed for railroad purposes. W.P. Blake named the Colorado Desert at this time. In 1854, Sam Warnock and Joseph Swycaffer established a bi-weekly military mail service from San Diego to Yuma. In 1857, the first transcontinental mail, the San Antonio-San Diego "Jackass Mail" was initiated by James Birch which followed the route and headed up Oriflamme Canyon to San Diego. In 1858, after Birch's death, the St. Louis San Francisco Butterfield Overland Mail was initiated. In the early 1860's, the California Volunteers military group used the Southern Emigrant Trail as a supply route between Camp Wright at Oak Grove and Fort Yuma. (The stage lines ceased to run at the start of the Civil War.) In 1890 the route was traveled by prospectors in search of minerals in the Anza-Borrego Desert. Use of the Southern Emigrant Trail declined at this time. In the late 1860's and 1870's, the Banning interests tried to establish a stage service to Yuma, but eventually failed. More northerly routes began to be used for transportation purposes. In the 1900's the desert route was used by homesteaders coming to the desert and it eventually became County Highway S-2, a two-lane paved road.



## Non-Visited Sites

### MASON VALLEY WELL

CLASS: 6

ACTIVITY: B

SITE TYPE: 32

DATE OF ORIGIN: Early 1900's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 3,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located in Mason Valley along dirt wash/road. Several miles west of County Highway S-2.

DESCRIPTION: Well. Not known if fence or any other materials surround it.

### ELLI RANCH

CLASS: 5

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1940's-1950's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 2,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Located in Mason Valley to the west of County Highway S-2 and Mason Valley ranch house described in 'Visited Sites.' Approximately one mile from the County road on a dirt road.

DESCRIPTION: A wooden type structure stands in the valley, most likely a ranch or temporary homesteaders cabin. Gate leading to the ranch was locked.

### COTTONWOOD CANYON TUNNELS

CLASS: 3

ACTIVITY: D

SITE TYPE: 19

DATE OF ORIGIN: 1890's-early 1900's

CADASTRAL LOCATION: T-14S, R-5E, Sec. 10,  $\frac{1}{4}$ -NE  
Sec. 15,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Located in Cottonwood Canyon, southwest of Mason Valley. Dirt roads or washes lead to the tunnel areas, located approximately 3-5 miles southwest of County Highway S-2.

DESCRIPTION: The tunnel are indicative of early prospecting done in these areas in the early 1900's by such men as Howard Bailey (of the Banner Mines). No full-scale mining was done.

### MASON HOMESTEAD

CLASS: 3

ACTIVITY: B

SITE TYPE: 04

DATE OF ORIGIN: 1880-1882



CADASTRAL LOCATION: T-14S, R-5E, Sec. 12,  $\frac{1}{4}$ -N of  $\frac{1}{4}$  SE  
 $\frac{1}{4}$ -SW of  $\frac{1}{4}$  NE  
 $\frac{1}{4}$ -SE of  $\frac{1}{4}$  SE

LOCATION REFERENCE: Located in upper Vallecito Valley.

DESCRIPTION: The Mason Homestead was preempted in 1880-81. James E. Mason and his family were living in the Butterfield Stage Station when the drought of the 1870's prompted them to relocate closer to water. Their claim in the upper Vallecito Valley was preempted in 1880-81 and the land was granted to them by U.S. patent in 1891 (Patent Book #9, p. 13). Two adobes were built as house and kitchen and later two more were added on. The house had an adobe chimney. In a photograph taken in 1912 (Reed, p. 89), the four adobes remained with their thatch roofs and paned windows intact. By 1934, little remained of the adobes except for the chimney and wall of the main house. Most likely nothing remains today except foundation.

FINNEUS SPENCER STRUCTURE TO THE WEST OF CAMPBELL RANCH ON THE  
HILLSIDE

CLASS: 2

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: ----

CADASTRAL LOCATION: T-14S, R-5E, Sec. 12,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: On the hillside of the Sawtooth Range overlooking upper Vallecito Valley. West of Campbell Ranch.

DESCRIPTION: Reportedly a large, rectangular structure made of rock with a tin roof and surrounded by tall poplar trees, it is owned and temporarily occupied by Finneus Spencer. The structure is kept open year round to people who may visit the isolated spot. The large structure can be seen from Highway S-2.



## McCain Valley

McCain Valley and the In-ko-Pah Hills surrounding the valley have been used for ranching since the early years of North American settlement in California. The valley runs in a northwesterly direction, with the original McCain Ranch at the northwestern end. The valley empties in the southeast, three miles north and east of Boulevard and Manzanita, small communities located along Old Highway 80.

The McCain family pioneered this valley in the 1860's. George W. and Martha McCain settled in the valley on August 18, 1868. They had originally come from Arkansas, settling in Mendocino County, California, in 1852. After living in Mendocino County for sixteen years, the McCains moved to the southern area of San Diego County known later as the McCain Valley (McCain Biographical File, San Diego Historical Society; Union B, 12/2/63, 4:1-3).

In 1868, the McCains built their temporary shelter in McCain Valley of tule and willow poles. Later, a comfortable adobe house with brush corrals and fences and a garden was built. Domestic animals were raised, but the McCains are best known for the cattle which they introduced into the valley. Grain was grown on the ranch for feed and dairy products were supplied to the miners at Julian.

The McCains had several children who also raised cattle in the valley or in nearby areas. One son, John McCain, went to Julian after that valley was settled, and became a blacksmith as well as a stage driver. He was also one of the first cattlemen to settle in the Borrego Valley further north (McCain 1955:102; Reed 1963:41-45). Laurence McCain, another son, and his wife Mary located in the lower end of McCain Valley on what became known as Tule Ranch. The property was later owned by James L. McCain ("Tule Jim"), son of Henry McCain. James L. McCain died in December of 1978 and the ranch became the property of D. McCain. Today, D. McCain and his family lease their ranch property. This ranch, known in earlier years as Tule Ranch and Manzanita Ranch is discussed in detail in the Tables under "D. McCain Ranch" (D. McCain, Oral Interview, July 7, 1979).

James L. McCain was responsible for developing the eastern section of the McCain Valley. Little remains of his original ranch houses, except a barn and several corrals. The house which is on the D. McCain property was built in 1921. The original ranch at one time encompasses 4000 acres and had many cattle. In 1937, James McCain constructed Tule Lake and its earthen dam hoping to attract buyers for the southern portion of his ranch. Most of the original structures built in the valley by the McCains have been moved or destroyed. The original George W. McCain ranch house fell within the boundaries of the study area but in the 1880's, the wooden structure was split



in half and moved to what is now the McCain Ranch, a 160-acre parcel in the Manzanita Indian Reservation, out of the boundaries of the study area (Union, 11/10/82, 3:3; D. McCain, Oral Interview, July 7, 1979).

Other members of the McCain family were active in the surrounding areas, mostly in the cattle business. Robert Lee (Bob) McCain, son of George, carved a 40,000 acre cattle ranch near Jacumba (part of the original McCain ranch?) (Union B, 7/4/61, 5:3). The ranch was sold in 1945 to Al Kalin of Brawley. William McCain grazed sheep in the area for a short time in 1881. Most of the McCains were active in community affairs at Campo and held offices there (Union, 1/10/82, 3:2). James L. McCain had a contract for delivering mail from San Diego to Campo in 1882 (McCain 1955:102). When George W. McCain died in 1882, his wife Martha remarried cattleman George B. Reynolds of Jamul in 1884 (Union B, 12/2/63, 4:1-3).

Settlers in the McCain Valley and surrounding areas engaged almost exclusively in cattle raising. Because most of the grazing land was limited by the nature of the land, the cattlemen drove their cattle between the desert in the winter and the mountain ranges in the summer. George McCain wintered his cattle in Mason Valley in the desert and Bob McCain wintered his cattle in the Canebrake Canyon area. Sometimes the cattle stayed on the desert year-round (in "wet" years) and ranged as far as Fish Creek in the Anza-Borrego Desert (Reed 1963:63; D. McCain, Oral Interview, July 7, 1979). Cattle were also grazed on the coast in Baja California. In 1910, the Imperial Valley served as a great feeding ground for cattle and many cattle were driven there. Campo became a center for San Diego County cattle ranching. The Campo Cattle Company, established in the 1880's, became one of the main cattle ranching operations of the area.

Communities south of McCain Valley included Boulevard and Manzanita. The McCain Valley schoolhouse, an adobe, was built near Manzanita in 1869. Jacumba, further south, became famous in later years (1920's-1930's) as a resort known as Jacumba Hot Springs. Residents of Imperial Valley traveled to this area. Today Boulevard and Manzanita have several older wooden structures remaining, as well as some stone structures and foundations. More recent restaurants, a store, gas station, sheriff's office, a few motels, a church, a post office, and some small ranches also stand in the area.

In 1957, the State Fish and Game Department requested that the Bureau of Land Management withdraw 38,691 acres in the McCain Valley from public lands for wildlife management (McCain Valley File, San Diego Historical Society). By 1961, the acreage was to become a new National Cooperative Land and Wildlife Management Area. The federal government decided that the land would remain undeveloped. Planners proposed that the valley would be used as grazing land, as a "haven for hunters" and as



a "refuge for the city" (Valley File, San Diego Historical Society). The project was called "an experiment in federal-state unity of purpose" (Union 9/3/61: "U.S. to Preserve McCain Valley"). A twelve mile access road into the "resource conservation area" was built as well as several recreation sites. The state aided in the road development (today a dirt road) and in construction of "quail guzzlers"--concrete paved areas to hold storm run-off for the wildlife. Campsites and picnic areas were constructed, including Cottonwood Recreation Site, White Arrow Recreation Site and Lark Canyon Recreation Site (still used today) (Union 9/3/64; Evening Tribune 4/23/64). The cost of roads and campsites was estimated at \$100,000, with the funds provided by the State Wildlife Conservation Board. Water improvement was also emphasized and new wells were drilled and existing springs and water holes cleared. The Sacotone Spring Recreation Site, however, was never built.

Cattle grazing continued in the valley without interfering with recreation. In fact, the opposite was true: recreation interfered with cattle grazing and gates had to be put up on previously undisturbed ranches. The valley was still inhabited by a few isolated ranches, most notably the McCains. These ranches are "islands" in the 38,000 acre conservation area. The ranches will remain with the owners unless the federal government can arrange to acquire the properties in exchange for other federal land areas. Approximately 1000 acres were privately owned in the late 1960's. Stock could be grazed on the conservation land under federal grazing leases. The area was closed to homesteading, however.

Miners and prospectors were opposed to the closing of the area to them; therefore, an area of 100 acres was opened in the southern part of the valley (Mt. Tule area) to mining claims (see lists). The conservation area in recent years has become a haven for off-road vehicles. The northern end of the valley is covered with dozens of man-made trails. The wildlife has virtually disappeared because of hikers and hunters. Hunting in the "wildlife conservation" area in early years decimated the deer population. With the disappearance of wildlife in the area, people with firearms are using the road signs as well as the equipment and stake-markers at the Mt. Tule-Sacotone Springs Mines, as targets.

Walker Canyon lies at the southern boundary of the McCain Valley area. The canyon begins in the east in a valley of Carrizo Creek south of Sizzle Spring and runs westward to a point halfway between Boulevard and Bankhead Springs. The canyon runs south and parallel to Tule Canyon and is intersected today by Interstate Highway 8. The valley possibly received its name in 1869 from an early settler, George P. Walker. The canyon may also take its name from an early filibuster of the 1850's, William Walker, who reportedly traveled through the valley (Evening Tribune, 2/4/38). In 1969, a 550-acre addition in this area was opened to the McCain Valley conservation area. The land was



reportedly purchased at \$15/per acre by the Wildlife Conservation Board (Valley File, an article by Winifred Davidson, San Diego Historical Society).

The McCain Valley has always been concerned with cattle raising until the Wildlife Management program was set up in 1961. Mining in the area was sporadic and limited in the Simons Canyon area in the northwest and the Mt. Tule are in the southeast. Most all of the structures in the valley today date from the 1930's and 1940's or after, except for the D. McCain ranch house, a few old barns and windmills scattered along the valley road, and 1890's corrals in the inner areas of the In-ko-pah Mountains in the northeast of the valley.

Most of the private owners of land in the valley--the cattle ranchers, do not appreciate the results of the valley being made into "Wildlife Management Areas." They cooperated in the beginning because they were assured the wildlife would be preserved and that the recreation areas would not interfere with their cattle ranching or the beauty of the valley and mountain lands. Unfortunately, that was not the case. The private owners (especially those who have been in the valley for many years, long before the Wildlife Management program was started) are disgusted with the vandalism, off-road vehicular traffic, and the apparent lack of controls and regulations by the program. They would like to see firearms abolished and stricter regulations put on the recreation sites. The original intent of the Wildlife Management program seems to have been a failure. The long-time residents of the valley are in favor of returning the total McCain Valley area back to its original use--cattle ranching, which doesn't affect the natural habitat the National Cooperative Land and Wildlife Management program proposed to protect in the first place.



## McCain Valley

### ORAL INTERVIEWS

| <u>DATE</u>                                                                                                                                                                                                                                                                                                                                                       | <u>INTERVIEWEE</u>     | <u>LOCATION</u>                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| July 7, 1979                                                                                                                                                                                                                                                                                                                                                      | Wuest Ranch caretaker  | Wuest Ranch, ½ mile east of McCain Valley Road, Tule Lake.                                                                                                                                                     |
| <p>The Wuest Ranch is owned by Shawn and George Wuest. They do not live on the ranch, but the caretaker allowed access to the structures on the ranch. The ranch was built in the late 1930's</p>                                                                                                                                                                 |                        |                                                                                                                                                                                                                |
| July 7, 1979                                                                                                                                                                                                                                                                                                                                                      | D. McCain and his wife | D. McCain Ranch is located approximately 1 mile north on McCain Valley Road from I-8 highway. It is located on the immediate east side of McCain Valley Road. ranch house is a red wooden barn-like structure. |
| <p>D. McCain is the last survivor of the original McCain family which settled the valley in 1868. He built his own ranch house in 1921 and the ranch consisted of approximately 4000 acres including the land now occupied by the Wuest Ranch. The D. McCains have lived in the valley all their lives and are the most reliable sources of oral information.</p> |                        |                                                                                                                                                                                                                |
| July 7, 1979                                                                                                                                                                                                                                                                                                                                                      | J. Cummins             | Ranch in McCain Valley or nearby. Interviewed at the D. McCain Ranch.                                                                                                                                          |

Also owns land in the McCain Valley and is in the process of building a new structure on his property. Has been in the valley many years.



## Historical Sites--McCain Valley

### Visited Sites

#### WUEST RANCH, TULE LAKE

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: Approximately 1939

CADASTRAL LOCATION: T-17S, R-7E, Sec. 22,  $\frac{1}{4}$ -NW  $\frac{1}{4}$  of SW

LOCATION REFERENCE: Located approximately  $\frac{1}{2}$  mile east of McCain Valley Road and  $\frac{3}{4}$  mile north of I-8 highway. At the west end of Tule Lake.

DESCRIPTION: The Wuest Ranch raises black angus cattle today. This complex of the ranch consists of a concrete block structure, several wooden/tin barns and sheds, a small tin house, and a tin structure with a windmill. A well currently in use also lies on the property. In 1937, Tule Lake, which lies directly east of the complex, was built by James L. McCain, who owned the valley at that time. He built the lake in the hopes that it would attract buyers for the land. The Wuests bought the land in 1939 and built structures near the dam, which are discussed below. An earth and rock dam with a spillway sits at this far east end of the lake. Today Shawn and George Wuest own the land and have a caretaker to run the ranch. The Wuests are fairly well off and do not live at the ranch. The structures in this complex are located at the west end of the lake and are the working structures of the ranch. The structures are all painted green.

#### WUEST RANCH "ROAD'S END" STRUCTURE

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1938-1939

CADASTRAL LOCATION: T-17S, R-7E, Sec. 23,  $\frac{1}{4}$ -NW  $\frac{1}{4}$  of SW

LOCATION REFERENCE: Located  $\frac{1}{2}$  mile east of above-mentioned ranch structures, at the far east end of Tule Lake. South side of lake.

DESCRIPTION: This original structure of the Wuest Ranch sits on a knoll overlooking Tule Lake, Tule Canyon, and McCain Valley. The structure has a stone base with tin and wooden walls and a slanted tin roof. The structure is two-storied. It also has a wooden outhouse near the lake and a concrete/stone small square structure sits near the house, probably a storage area. A windmill and tin quonset hut with a concrete base sits on the property. The house structure has recent additions, also a brick chimney. A large, old bell hangs on the front of the structure.

#### WUEST'S CASA DEL OSO, WUEST HOUSE

CLASS: 5



ACTIVITY: B  
SITE TYPE: 06  
DATE OF ORIGIN: 1950's-1970's  
CADASTRAL LOCATION: T-17S, R-7E, Sec. 22, ¼-NE

LOCATION REFERENCE: Located on the north side of Tule Lake at the east end of the lake, approximately 3/4 miles from the McCain Valley Road. Directly north of the "Road's End" structure.

DESCRIPTION: This complex consists of more recent structures of concrete block with tin roofs. A concrete block house and a more recent concrete block garage stand on the property. An inactive windmill, equipment such as wagons, etc., corrals and wooden troughs also stand on the temporarily abandoned property. This complex was probably built later than the "Road's End" structure which was the original ranch-house (1939).

#### WELL AREA OF THE WUEST RANCH

CALSS: 2  
ACTIVITY: B  
SITE TYPE: 06  
DATE OF ORIGIN: 1920's-1930's  
CADASTRAL LOCATION: T-17S, R-7E, Sec. 22, ¼-NW

LOCATION REFERENCE: Located along a road leading from McCain Valley Road to Tule Lake, north of the lake and Wuest ranch houses.

DESCRIPTION: A well on the Wuest Ranch property is surrounded by corrals in order to provide easy access to the water for cattle. The fenced fields, corrals, and wooden troughs probably date from the days when the McCains owned the property as numerous cattle were grazed in this area. Several small tin sheds and shacks also stand in this area. A concrete block/tin house with windows and a small shack also stand near the well area.

#### SAN DIEGO COUNTY CONSTRUCTION LABORERS TRAINING AND RETRAINING SCHOOL

CLASS: 5  
ACTIVITY: B  
SITE TYPE: 09  
DATE OF ORIGIN: 1978  
CADASTRAL LOCATION: T-17S, R-7E, Sec. 16, ¼-SE

REFERENCE LOCATION: Located immediately to the west of McCain Valley Road approximately 1 mile from I-8 highway. Directly southwest of the D. McCain Ranch.

DESCRIPTION: This structure is a brand-new wood frame/stucco and glass building, painted brown with a new paved road leading to it. Not in use currently as construction is still not completed.

#### D. MCCAIN RANCH

CLASS: 1



ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1921

CADASTRAL LOCATION: T-17S, R-7E, Sec. 16, ¼-SE

REFERENCE LOCATION: Located immediately to the east of McCain Valley Road just northeast of the Construction Laborers Training School.

DESCRIPTION: This ranch, which once consisted of 4,000 acres (including what is now Wuest Ranch) is occupied by the D. McCain family, the last of the McCains in the valley. The original wooden ranch-house which was built in 1921, still stands on the property and is inhabited by the family. The ranch house is barn-like in shape, painted red, and has a stone chimney. Various small sheds, several small gardens, and a windmill structure being used as a TV antennae stand on the property. Cattle and horses are grazed in the fenced valley lands surrounding the house. The McCains no longer own the ranch; they lease it from the Laborer's Union (of the above-mentioned school) to which it was sold in 1978-79. Cattle will continue to be grazed on the ranch.

#### WINDMILL

CLASS: 1

ACTIVITY: B

SITE TYPE: 32

DATE OF ORIGIN: 1890's-1900's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 15, ¼-NW

LOCATION REFERENCE: Located immediately to the east of McCain Valley Road approximately ¾ mile north of the D. McCain Ranch.

DESCRIPTION: The windmill sits isolated with no structures nearby except a few old corrals. Probably once part of the many acres owned by the McCains in the valley.

#### BEEHIVES

CLASS: 5

ACTIVITY: B

SITE TYPE: 34

DATE OF ORIGIN: 1930's-1970's

CADASTRAL LOCATION: Located immediately to the west of McCain Valley Road across from the windmill mentioned above

DESCRIPTION: A cluster of 20 to 30 beehive boxes sit amongst oak trees in this part of the valley.

#### CAMP-TYPE STRUCTURES (CONSTRUCTION LABORER'S SCHOOL?)

CLASS: 5

ACTIVITY: B

SITE TYPE: 09



DATE OF ORIGIN: 1950's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 9,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located approximately  $\frac{1}{4}$  mile west of McCain Valley Road at a junction in the road leading to Sacotone Spring on the east and up McCain Valley on the west. This is the last set of structures encountered in the study area in the McCain Valley before it heads north west.

DESCRIPTION: This complex consists of a large number of structures which looks like a school with temporary residential facilities. One large, recent stone house stands on a hill above 16-20 white triangular shaped structures of plywood and tin. An airstrip built in the 1950's stands to the rear of the large house. Totem poles, two water towers and a water reservoir also stand on the property. The structures were all built in the 1950's or later, and possibly were used by the laborers for the Wildlife Conservation area work.

#### RANCH NORTH OF THE ABOVE STRUCTURES

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: 1900's?

CADASTRAL LOCATION: T-17S, R-7E, Sec. 9,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located to the west of McCain Valley Road, directly north of the school camp-type structures mentioned above.

DESCRIPTION: The ranch consists of an old wooden barn, probably built in the 1910's by Bob McCain, who once owned a ranch in the area. The ranch house structure is of plywood with tin, and a stone base. A large warehouse-type barn with a stone base and tin walls and roof also stands near the ranch house. Stone fences surround parts of the property. A man-made earthen reservoir stands north of the structures to hold water for cattle which are grazed in this lower end of Lark Canyon.

#### MT. TULE MINE

CLASS: 2

ACTIVITY: D

SITE TYPE: 19

DATE OF ORIGIN: Early 1900's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 2,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Located to the north of a dirt road leading to Sacotone Spring, approximately  $\frac{1}{2}$  mile north of Mt. Tule

DESCRIPTION: This mining tunnel is framed and shored up with wooden beams. Now abandoned, the mine has been vandalized in recent years. Spudomene, particularly kunzite, was mined in this area. The mineral is a lithium silicate with aluminum. By 1905, scores of mines were being worked in the Jacumba area, and in 1906, the gem output of San Diego reached its highest point. Work in the mines was revived again in the late 1920's



and by "rock-hounds" in the 1930's. Pieces of quartz and mica are still scattered on the site.

#### SCHOOL MINE

CLASS: 5

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: 1950's-1970's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 2,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located in the vicinity of Sacotone Spring, along a dirt road north of Mt. Tule

DESCRIPTION: Owned by J. Bettell, this mine consists of a few shallow pits where surface mining was attempted. No large scale mining was done.

#### BEVERLY GEM MINE

CLASS: 5

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: 1950's-1970's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 2,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located in the vicinity of Sacotone Spring, along a dirt road north of Mt. Tule. Adjoins the School Mine.

DESCRIPTION: Owned by Fisher, Decker and Beken. This mine also consists of shallow pits and tailings. After McCain Valley was designated a conservation area in 1963, 10 acres in this area were left open to claims for mining purposes of beryl, tungsten, quartz and feldspar.

#### ROSE MARIE MINE

CLASS: 5

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: 1960's-1970's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 2,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located immediately east of Sacotone Spring, overlooking Carrizo Gorge to the east.

DESCRIPTION: The mine consists of a few small-scale pits and tailings. Quartz and mica pieces are scattered in the area.

#### LITTLE CAT MINE

CLASS: 5

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: 1960's-1970's



CADASTRAL LOCATION: T-17S, R-7E, Sec. 2,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located east of the Beverly Gem Mine near Sacotone Spring, north of Mt. Tule

DESCRIPTION: This mine also consists of pits and tailings. No mill site or equipment is found at any of these mines.

#### SACOTONE SPRING

CLASS: 5

ACTIVITY: B

SITE TYPE: 34

DATE OF ORIGIN: 1960's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 2,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Sacotone Spring is located on a dirt road to the north of Mt. Tule. The area overlooks Carrizo Gorge on the east.

DESCRIPTION: Sacotone Spring was an area designated by the resource conservation project to be a recreation site in 1964. However, no structures or campsites exist in the area. It was probably decided that this area be opened to mining claims only. The project did entail the construction of a "quail guzzler" in this area--a concrete paved area to hold storm runoff for the purpose of providing water to the wildlife of the area. A concrete covering also houses the spring, which is now dry.

#### LARK CANYON RANCH STRUCTURES

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: Early 1900's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 4,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: The ranch house structures are located approximately  $\frac{1}{2}$  mile west of McCain Valley Road near the junction of Redondo Flat on the east. This is the northern end of Lark Canyon.

DESCRIPTION: The turn-of-the-century ranch complex consists of two green wooden structures at the south end, with a stone chimney and tarpaper roofs. A large tin barn stands north of these structures, also a shack and a tin garage structure. North of the barn lies two newer structures, partly hidden under large oak trees. They are also painted green and have tin vents with tarpaper roofs. Two structures, an occupied house and a garage/barn sit at this north end of the complex.

#### REDONDO SPRINGS

CLASS: 5

ACTIVITY: B

SITE TYPE: 34

DATE OF ORIGIN: 1960's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 2,  $\frac{1}{4}$ -NW



LOCATION REFERENCE: Located on a dirt road leading from Lark Canyon. Redondo Springs is on the eastern side of the road, located in the In-ko-pah Mountains overlooking Carrizo Gorge.

DESCRIPTION: Redondo Springs has no structures and no visible mines. A "quail guzzler" was built here also, to provide water to wildlife.

#### LARK CANYON CAMPGROUND, RECREATION SITE

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1960's-1970's

CADASTRAL LOCATION: T-16S, R-7E, Sec. 28,  $\frac{1}{4}$ -SE  
Sec. 33,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located along McCain Valley Road in the hills above Lark Canyon.

DESCRIPTION: This recreation site is equipped with a windmill and well, water tanks, picnic tables, sanitation structures and plenty of off-road tracks in a supposedly "preserved" area.

#### LOST VALLEY ROAD AIRWAY BEACON

CLASS: 5

ACTIVITY: E

SITE TYPE: 10

DATE OF ORIGIN: 1930's-1940's

CADASTRAL LOCATION: T-16S, R-7E, Sec. 29,  $\frac{1}{4}$ -NW

LOCATION REFERENCE: Located on a hill overlooking McCain Valley on the east and Lost Valley on the west. Near benchmark #4138.

DESCRIPTION: This airway beacon station, now abandoned, has a small white structure of plywood with a red tin roof. The small house has an aluminum chimney and doors and windows which have since been broken out. Beehives sit below the site on Lost Valley Road.

#### IN-KO-PAH MT. SPRINGS AND LAKES, CORRALS

CLASS: 2

ACTIVITY: B

SITE TYPE: 06

DATE OF ORIGIN: Early 1900's

CADASTRAL LOCATION: T-16S, R-7E, Sec. 7,  $\frac{1}{4}$ -NE  
T-16S, R-6E, Sec. 1,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located near dirt roads in the In-ko-pah Mountains at the northeast end of McCain Valley Road. The high plateau area overlooks Bow Willow Canyon and Rockhouse Canyon.

DESCRIPTION: The corrals which surround the lake and springs area once served the McCain Ranch and cattle in the late 1800's and early 1900's. Cattle are still grazed in this area today, which is fenced off to off-road vehicles.



WHITE ARROW RECREATION SITE

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1960's-1970's

CADASTRAL LOCATION: T-16S, R-6E, Sec. 10,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located to the west of McCain Valley Road, approximately  $\frac{1}{2}$  mile. At the foot of the In-ko-pah Mountains western ridge.

DESCRIPTION: This campsite has a sanitation structure for public use, also picnic tables.

COTTONWOOD RECREATION SITES

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1960's-1970's

CADASTRAL LOCATION: T-16S, R-6E, Sec. 2,  $\frac{1}{4}$ -SW

LOCATION REFERENCE: Located on both sides of McCain Valley Road, the site consists of an east and west campground.

DESCRIPTION: Primitive campgrounds with no structures. Part of development of Wildlife Conservation Area.

WALKER-CANYON STRUCTURES (322-02)

CLASS: 3

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: Early 1900's?

CADASTRAL LOCATION: T-17S, R-7E, Sec. 24,  $\frac{1}{4}$ -SE  $\frac{1}{4}$ 

LOCATION REFERENCE: The two structures are located at the north-eastern end of Walker Canyon. No roads lead to the area from the west, but a trail leads to the northwest, possibly through Tule Canyon to McCain Valley.

DESCRIPTION: The two wooden structures built of milled lumber have collapsed on their foundations. The foundations of both of the structures are of concrete and granite and the structural wood is scattered over the site. Standing near one of the structures is a small granite and concrete wall. Trash, glass pieces (purple, aqua, and clear), tin cans, house hardware, a porcelain license plate, and various railroad paraphernalia such as ties and rails also were found in the area. The site may have been used as a rest area for men working on the San Diego and Airzona Eastern Railroad in 1916-1919 (in the Dubber Spur and Carrizo Gorge areas). The porcelain license plate is also indicative of the advent of the automobile in these early years of the twentieth century. Walker Canyon would serve as a water source to the workers at that time. No large corrals or ranching equipment were found on the site.



## Non-Visited Sites

### SOUTHWEST LARK CANYON WATER AREA

CLASS: 5

ACTIVITY: B

SITE TYPE: 32

DATE OF ORIGIN: 1950's

CADASTRAL LOCATION: T-17S, R-7E, Sec. 8,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: Located on a dirt road leading out of Lark Canyon westward toward McCain Valley. About 1 mile west of McCain Valley Road.

DESCRIPTION: A well is located here as well as a structure.

### ROCKHOUSE CANYON STRUCTURE AND RESERVOIR

CLASS: 1

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: Early 1900's

CADASTRAL LOCATION: T-16S, R-7E, Sec. 3,  $\frac{1}{4}$ -NW  
Sec. 4,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: Located at the west end of Rockhouse Canyon at the end of a jeep trail leading into the canyon. The Canyon empties into Carrizo Canyon on the east. The house is approximately  $1\frac{1}{2}$  miles into the canyon.

DESCRIPTION: Rockhouse Canyon was named after the structure which lies at the west end of it. A cattleman's shack built of stone and mortar stands in the canyon. A man named E. Larson reportedly once owned the property. A cement water trough fed by a spring stands near the structure. A shallow cement reservoir also stands near the structure to hold water for wildlife in the area (Parker, p. 88).

### BOW WILLOW CANYON FOUNDATION AND PALMS

CLASS: 3

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: Early 1900's

CADASTRAL LOCATION: T-15S, R-7E, Sec. 32,  $\frac{1}{4}$ -SE  
Sec. 33,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: The structure foundation is located in the upper end of Bow Willow Canyon to the southwest. The canyon is located north of Rockhouse Canyon. Bow Willow Palms is located on the hills directly southwest of the Canyon.

DESCRIPTION: In this upper end of Bow Willow Canyon, near a saline seep lies the foundations of a cattleman's shack. The half dozen palm groves further up the canyon contained approximately 200 trees in 1963 (Parker, p. 209).



### THING VALLEY ROAD

CLASS: 2

ACTIVITY: E

SITE TYPE: 26

DATE OF ORIGIN: 1880's

CADASTRAL LOCATION: T-15S, R-6E, Sec. 32,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: This portion of Thing Valley Road is located to the north of Thing Ranch about  $\frac{1}{2}$  mile. It is in a narrow section of the valley which runs north-south following La Posta Creek.

DESCRIPTION: The Thing Brothers, after whom Thing Valley is named, built this road as access to their ranch in the 1880's. Joseph L. and Edward Thing came to the area in 1873 to raise cattle. In the early 1880's, they were working on the adobes for their ranch houses and on building the road. Another account states that the Thing ranch house was wooden with adobe outhouses. Joseph Thing was patented 320 acres of land in the valley. Thing Valley Road leads to the north and west to the Mt. Laguna area. The Things not only raised cattle, but owned stores and operated post offices in Potero and Tecate.

### SIMMONS CANYON TUNNELS AND PROSPECTS

CLASS: 2

ACTIVITY: D

SITE TYPE: 16, 17, 18, 19

DATE OF ORIGIN: 1920's

CADASTRAL LOCATION: T-16S, R-6E, Sec. 16,  $\frac{1}{4}$ -NW, SW, SE

LOCATION REFERENCE: Simmons Canyon is located in the western In-ko-pah Mountains to the northwest of McCain Valley. Jeep trails lead into the prospect area from Thing Valley in the northwest.

DESCRIPTION: There are several small prospects, shafts and tunnels in this area. Reportedly arsenopyrite and pyrite were mined here in the 1920's and later years (General Mines File, San Diego Historical Society).



## Table Mountain

The Table Mountain/Gray Mountain area contains mines and surface quarries. No permanent settlements were made in this rocky, desert mountain terrain. The Mica Gem Mine and mill site was the largest mining operation in this area (1937), and several smaller mines and quarries were scattered in the surrounding areas of Table Mountain in the 1930's and 1940's.

Jacumba, a community to the southwest of the Table Mountain area on old Highway 80, became the center of the Jacumba Mining District established in the early twentieth century. By 1905, scores of mines were being worked in the Jacumba area. In 1906, the gem output of San Diego County had reached its highest mark. Essonite and succinite were found in deposits bordering the desert. Beryl, kunzite, and garnet were mined at Dos Cabezas from 1895 to 1905, north of the Table Mountain area and 17 miles northeast of Jacumba. Mines which did not extract gems produced californite (calcium alumina silicate), apatite (a phosphate of lime), asbestos, gypsum, graphite, manganese, sulphur, marble, molybdenite, and several other minerals.

In 1928, there was a revival in the production of beryl, kunzite, tourmaline, topaz, and garnet in San Diego County. In the 1930's, gem mining decreased because of the effects of the Depression and the marketing of synthetic gems. Miners at this time were generally known as "rockhounds" and they searched for unusual specimens as a hobby. The typical gem miner in the 1950's in this area was a rancher who worked on the mine when work on the ranch was light.

Claims were staked for almost every kind of mineral resource in the vicinity of Jacumba. Mines such as the Little Randsburg, north of the Mica Gem Mine, mined tungsten, of which there was a high demand during World War II, but the mine was not very successful. The Carrizo Gorge Tungsten Mine reportedly produced clacite, quartz, zoisite, and several other minerals (General Mines File, San Diego Historical Society).

In 1927, one of the principal industries of the area was the production of feldspar, sand, and gravel. The Standard Sanitary Manufacturing Company had placed a sand and gravel plant in operation in Campo. San Diego's post-World War II building boom contributed to the need for sand and gravel; therefore, one of the County's major industries became the mining of these materials for building and street construction.

The Table Mountain area was known more for its minerals essential to manufacturing than for its rare gems. The mines are no longer in full operation and the road to the Table Mountain area is now used chiefly for access to transmitting stations atop two peaks to the north of Table Mountain.



A major transportation route to San Diego runs through the southern edge of the Table Mountain area. Interstate Highway 8, completed in the early 1970's, lies north and parallel to old Highway 80, now a two-lane paved access road to Jacumba and other small communities such as Boulevard, Bankhead Springs, Manzanita, and Live Oak Springs further east. The history of this transportation route is explained in the Tables. In 1931, San Diego put into effect a "Major Street Plan" involving all roads in San Diego County, including the proposed State Highway 80, which would be constructed or improved unit by unit. It was scheduled for completion by 1956. Interstate Highway 8 work began in 1964.

The Carrizo Gorge area is known for the railroad which runs along its steep hillside terrain. The railroad also runs south, to the east of Round Mountain, another section of the study area. The Round-Mountain area has no other resources of historical significance.

In the early 1900's, San Diegans were still looking for a railroad route east. The first continental railroad had by-passed San Diego and connected with San Francisco in 1869 (Central Pacific-Union Pacific). In 1882, the Southern Pacific ran tracks to Needles, Los Angeles, and Yuma, but San Diego was still excluded. Many proposals and plans were made in the subsequent years, but none were ever materialized. By 1885, San Diego had a spur line from Los Angeles along the coast, and a connection with the transcontinental line at Barstow. Several secondary lines were built in the County but no railroad ran directly east.

In 1900, a committee in San Diego headed by Goerge W. Marston was to make another attempt to get a railroad east. A man named William E. Smythe promoted the railroad and tried to raise financial backing for it on the east coast. His attempts were fruitless, but later a charter amendment proposal by the city of San Diego for the railroad was approved. The San Diego and Arizona Eastern Railroad Company was organized and subscriptions to a \$40,000 fund needed for surveys and purchases of right-of-ways were obtained.

In December of 1906, the Company's chief stockholders, John D. Spreckels, A.B. Spreckels, William Clayton, and Harry L. Titus formed articles of incorporation, taking over the right-of-ways and franchises of the San Diego and Arizona Eastern Railroad Company. The corporation then became the San Diego and Arizona Corporation and cost for the total railroad from San Diego to El Centro was estimated at \$6,000,000 (Dodge, p. 65-67).

On September 7, 1907, with aid from the Southern Pacific Railroad, construction began on the San Diego and Arizona Railroad. It was completed twelve years later, in 1919



connecting with the Southern Pacific in El Centro and with the Santa Fe at National City and San Diego. The railroad crossed through the Mexican border on the south four times between San Diego and Yuma. The total cost of the railroad exceeded \$18,000,000.

The Carrizo Gorge section of the railroad proved most difficult, time-consuming, and expensive. Construction was started on this eleven-mile stretch in 1916 and not completed until 1919. The railroad is perched on the eastern side of the gorge on steep hillsides. The seventeen tunnels and fourteen side-hill trestles that had to be constructed delayed the opening of the railroad. The cost of the Carrizo Gorge area alone was \$4,000,000.

By the time the railroad was finished, the automobile had become a more common mode of travel and some of the farmers in the Imperial Valley were using other more direct railroad lines to ship their crops. By the 1930's, trucks were also being used to ship goods. The railroad was never totally successful. Presently, rail service is provided along the San Diego and Arizona Railroad from Yuma to Plaster City. To the west, the railroad was severely damaged by the 1976 tropical storm (Hurricane Kathleen). The Pacific Southwest Railway Museum Association, Inc. (280-1781) was formed in 1961, dedicated to the "preservation, restoration and operation of steam and diesel locomotives." The Association has obtained a \$5,000 grant from the J.W. Sefton Foundation in San Diego to build a permanent railroad museum commemorating the San Diego and Arizona Eastern Railroad in east San Diego County, at Campo (San Diego Union G 6/4/72, 1:1-3; San Diego Historical Society).



## Historical Sites--Table Mountain

### Visited Sites

#### MICA GEM MINE AND MILL SITE

CLASS: 3

ACTIVITY: D

SITE TYPE: 10, 16, 21

DATE OF ORIGIN: May 6, 1937

CADASTRAL LOCATION: T-17S, R-8E, Sec. 35,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: The mine is located along a dirt road to the southeast of Table Mountain and approximately  $\frac{1}{2}$  mile north of I-8.

DESCRIPTION: The Mica Gem Mine, located in the Jacumba Mining District, was located by J.H. Hubble and Looke in 1937. The Mica Gem Group consisted of 19 mines in the area, and were operated into the 1940's. The mines were scattered on the east side of Table Mountain, where tailings and quarries can be seen today. At the Mica Gem Mine site are several prospecting pits. A mill site also stands at the location but the only remains of the mill are its concrete foundations and posts and a wooden structure at the east end of the mill site. Across the road from the mill site is a concrete foundation which probably was the site of a supervisor's quarters. Lumber lies scattered in the area as well as some fixtures (Minings Claims Book #643, pp. 426-628).

#### LITTLE RANDSBURG GROUP MINE SITE

CLASS: 2

ACTIVITY: D

SITE TYPE: 16

DATE OF ORIGIN: September 2, 1936

CADASTRAL LOCATION: T-17S, R-8E, Sec. 26,  $\frac{1}{4}$ -SE

LOCATION REFERENCE: The mine site is located on a jeep trail at the base of a hill off Table Mountain Road, approximately 2 miles north of the Mica Gem Road.

DESCRIPTION: This mine was discovered by W.T. and E.T. Winterton and J.H. Hubble in 1936 and was worked at least through 1942. The mine is located on a tungsten quartz lode in Jacumba Mining District. The only remains of the mine today is an open pit and tailings (Mining Claims Book #578, p. 430).

#### TABLE MOUNTAIN TRANSMITTING STATIONS

CLASS: 5

ACTIVITY: B

SITE TYPE: 10

DATE OF ORIGIN: 1960's-1970's

CADASTRAL LOCATION: T-17S, R-8E, Sec. 22,  $\frac{1}{4}$ -SE  
Sec. 26,  $\frac{1}{4}$ -NW



LOCATION REFERENCE: The two transmitting stations sit on peaks to the north-east of Table Mountain along dirt roads which provide access to them.

DESCRIPTION: The transmitting stations are two small, white structures located on mountain peaks, still in use today. Antennae are located near the structures. Lines run to the stations along poles located along the access road leading to them. The road in the Table Mountain area is used mostly as access to these stations, and is maintained for that use.

#### NORTHWEST TABLE MOUNTAIN AREA PROSPECTS, QUARRIES, AND TUNNELS

CLASS: 6

ACTIVITY: D

SITE TYPE: 16, 19

DATE OF ORIGIN: 1920's-1930's

CADASTRAL LOCATION: T-17S, R-8E, Sec. 21,  $\frac{1}{4}$ -NW, NE, SW, SE  
Sec. 27,  $\frac{1}{4}$ -NW, SE

LOCATION REFERENCE: The prospects, quarries, and tunnels are located in a canyon/plateau leading northwest from Table Mountain. Dirt jeep trails provide access to the area.

DESCRIPTION: The quarries, prospects, and tunnels in this area are evidence of the surge of mining in the Jacumba area after the 1905 rush. In 1927, the principal mines and prospects in this area produced feldspar, tungsten, asbestos, sand, and gravel. Few gems were mined at this time. A sand and gravel plant was in operation in Campo since 1926, which provided incentive for a good deal of the mines (General Mine File, San Diego Historical Society). Minerals basic to manufacturing were mined. San Diego's postwar (WWII) building boom contributed to a large share of the sand and gravel industry in the 1940's. One of the County's major industries was and is the mining of such materials for building and street construction.

#### ALTERNATE EASTERN ROUTE/PRESENT I-8

CLASS: 2

ACTIVITY: E

SITE TYPE: 25, 26, 27, 29

DATE OF ORIGIN: 1785 to present

CADASTRAL LOCATION: ----

LOCATION REFERENCE: The present roadway (Interstate Highway 8) runs east-west through the southern part of the Table Mountain study area. It also runs directly south of the McCain Valley study area, east-west through Walker Canyon. The earlier routes (before I-8 was constructed) ran south of the present highway, along the site of Old State Highway 80.

DESCRIPTION: In the 1850's, San Diegans were looking for a shorter route eastward and to Yuma rather than the Warner's Route to the north. Routes to San Diego in the south were merely poor unimproved wagon trails. Pedro Fages had first explored the south-



eastern pass through Jacumba in 1785 on one of his many trips to the desert. This Alternate Eastern Route, however, led mostly through Mexican territory in the south. Many men followed the route in California's Gold Rush years. In the late 1840's, with the establishment of military posts on the Pacific, it was imperative for mail to reach the coast. In 1849, a military mail route was set up from San Francisco to San Diego and to Yuma. The route ran from San Diego to the Tijuana River, on the Mexican side of the border for 40 miles, entering S.D. County near Campo and continuing east down Walker Canyon, Mt. Springs Grade and on to Yuma. In 1851, the eastern part of this route was incorporated into the Lyon Route--a trail pioneered by Captain Nathaniel Lyon which forked north and westward near Campo to follow Cottonwood and Hauser Creeks. Cattle, sheep, mail, and military supplies bound for Ft. Yuma used this route. In 1854-56, Joseph Swycaffer and Samuel Warnock were contracted by the Army to deliver mail bi-weekly between San Diego and Ft. Yuma. They served Campo, Buckman Springs, and Jacumba along the route. The building of Potrero Grade in 1870 opened the new San Diego to Campo route and bypassed the Mexican territory. In 1857, since these southern roads were still not improved for wagon travel, the Board of Supervisors of San Diego County authorized Supervisor Smith and County Surveyor Robert W. Groom to locate an easy route to the desert. In 1865 their road became known as the Smith/Groom County Road. It ran through Descanso, Pine Valley, La Posta, thru Walker Canyon near Boulevard and down to Mt. Springs in the desert. In the 1860's, this became the principal route to the desert and between San Diego and Ft. Yuma. Also in the late 1860's the road to the desert was improved with a better grade down Mt. Springs Pass and in 1870 the San Diego-Ft. Yuma Turnpike Company petitioned the Board of Supervisors to establish a toll road along this route. A toll house was soon set up at Mt. Springs at the Pete Larkin House. In 1878, the Board of Supervisors relocated the road, eliminating the need for the toll road. In 1909, a Highway Commission was formed for the County with A.G. Spaulding, E.W. Scripps, and John D. Spreckels on the committee. In 1919, another committee was formed and plans for paving were set up. By 1921, the route was paved from San Diego to Alpine and an oil-surface road ran from Live Oak Springs down Mt. Springs Pass. Farther east, Imperial County's plank road (1914) was also made an oil-surface road in 1924. The increase of automobile traffic necessitated better roads along this route. In 1927, the federal government allocated funds for interstate highways and a narrow concrete highway (Highway 80) was built from San Diego to Imperial Valley. In the early 1930's, a better, wider 2-lane paved road was built and improved periodically. In the 1950's, Highway 80 east of Alpine was being paved at a total approximate cost of \$2,000,000.00, scheduled for completion in 1955-56. In 1964, work was started on Interstate Highway 8 from San Diego to Yuma and the route was completed by 1972. The new freeway, a separated highway, follows almost the same route as Highway 80 through the study area. Interstate 8 travels parallel with 80 and north of it, bypassing Jacumba, Bankhead Springs, Boulevard, Manzanita and



Live Oak Springs. Highway 80 drops south to join Highway 94 while 8 heads northwest toward San Diego.

SAN DIEGO AND ARIZONA EASTERN RAILROAD (CARRIZO GORGE AREA)

CLASS: 1

ACTIVITY: E

SITE TYPE: 24

DATE OF ORIGIN: 1907-1919

CADASTRAL LOCATION: T-17S, R-8E, Sec. 17,  $\frac{1}{4}$ -SW  
Sec. 18,  $\frac{1}{4}$ -SE  
Sec. 19,  $\frac{1}{4}$ -NE

LOCATION REFERENCE: In the study area, the railroad is located in Carrizo Gorge, northeast of Table Mountain. The railroad also passes to the east of Round Mountain further south in the study area.

DESCRIPTION: In 1900, San Diego was still in need of a railroad route east after the transcontinental railroad was taken to San Francisco in 1869. Headed by George W. Marston, a committee was formed in 1900 to make an attempt to get the railroad east. In 1907, construction began on the railroad which would run from National City to San Diego to El Centro and connect with the Southern Pacific there. The railroad, because it traveled through harsh terrain, was not completed until 1919. The Carrizo Gorge trestle was under construction in 1916. It was the most difficult part of the railroad to build as it involved 17 tunnels and 14 "side-hill" trestles. This part of the railroad delayed its opening and the total cost of the Gorge area alone was estimated at \$4,000,000. The total cost of the railroad exceeded \$18,000,000.

Presently, rail service is provided along the San Diego and Arizona Eastern Railroad from Yuma to Plaster City. To the west, the railroad was severely damaged by the 1976 tropical storm (Hurricane Kathleen). The Pacific Southwest Railway Museum Association, Inc. (280-1781) was formed in 1961, dedicated to the "preservation, restoration, and operation of steam and diesel locomotives." The Association has obtained a \$5,000 grant from the J.W. Sefton Foundation in San Diego to build a permanent railroad museum commemorating the San Diego and Arizona Eastern Railroad in East San Diego County, at Campo (San Diego Union G 6/14/72, 1:1-3; San Diego Historical Society).







## V. REGIONAL RESEARCH DESIGN

A regional research design was requested as the final component of this study to identify likely theoretical and methodological interests for future research or impacts management projects. In conventional practice, research designs structure methods of selection, recovery, and analysis of data so that particular and explicitly stated goals may be met. These goals may be derived from previous studies conducted within a discipline for a certain area, or from new or different approaches from outside that may redirect efforts or integrate separate spheres of interest.

BLM defines cultural resources broadly to include the subjects of archaeology, history, ethnology, and ethnic heritage and ideological values which overall planning efforts are to address. Fully extended, a regional research design would attempt to integrate these various kinds of specialized studies so that broader issues which subsume the scope of individual projects may be addressed. The interests of heritage values or ethnography are, however, methodologically distinct considerations from those focused upon for this study, and need to be addressed more specifically in a separate report. Major research themes for historic resources have been summarized in the Class I overview (Wirth Associates, 1978) and inventory presented here, which should provide sufficient direction for future work. This discussion will therefore focus upon prehistoric archaeological concerns.

Under existing conditions the majority of work will undoubtedly continue to be oriented toward impacts assessment and mitigation projects. These vary widely in purpose and scope, as they are born of external requirements rather than systematically derived research priorities. Of most pressing concern is to provide a means for these disjunct studies to be integrated so that cumulative benefits can accrue.

For this region, the goal of studying prehistoric sites should be the development and testing of theoretical statements concerning the structural and behavioral systems of hunter-gatherers in both specific regional contexts and as a general adaptational configuration. This goal is approached through studies of regional cultural history and the more integrative and universally applicable studies of cultural process.

Mainly idiographic in orientation, culture history studies organize archaeological phenomena into stylistically and contextually distinct traditions that are mapped across spatio-temporal dimensions. Identity, time depth, and regional distribution are major concerns. Nomothetic processual studies address the systemic function and changes within a given adaptational configuration or its components. The former school might seek, for example, the source, date of introduction and range of acceptance of ceramics to the area; while the latter might model and test the relationship of ceramics, as a



storage technology, to the kinds and distribution of milling features, as processing technology. One describes and inventories events to highlight major changes, while the other seeks the relationships within and between components to explain stability or change.

Both methods are necessary for pursuing the goals stated. Deciding the propriety of these differing emphases is the responsibility of the discipline. But as BLM has responsibility for the condition and uses made of a limited and non-renewable resource base, they will also have to evaluate propriety. Certain general criteria for research proposals are suggested which should be demonstrated before public sanction is given:

1. That the research is designed to articulate with or enhance other interests within the overall system of inquiry; that is, it has the potential to increase understanding beyond the scope of the proposed research itself.
2. That observable phenomena be defined and analyzed so that inferences and hypotheses may be evaluated within logical or probabilistic models of certainty.
3. That expenditures of time, energy, and cultural resources consumed be commensurate with research output. This is not intended as a monetary cost/benefit criteria but as a conservation of resources vs. information gain decision.

The agency's prime concern will be item three, but this requires some evaluation of items one and two. To this end, the kinds and quantities of information compiled in the Class I and II studies should be used as a base, with an underlying emphasis on evaluating the effects of an action upon one of a population of resources, rather than as a unique or isolated event affecting one resource or area. Operationally, this requires evaluating how many similar or suitable sets of data, sites, or areas are available, and the degree to which other interests may be satisfied or compromised, as the basis for evaluating the use of a particular resource for study. That a particular site can be used and expected research needs met is not a sufficient criterion. Rather, it is whether sufficient resources exist such that the loss of one is not severely compromising to the remaining population, that competing or simply dissimilar interests are not abrogated for the sake of one action, and that the particular needs of the data recovered are not better met elsewhere. This requires a management program that actively maintains estimates of the number and types of sites, promotes accessibility to previously collected information, and ensures consistency and reliability of reported results.

Information management is the most critical research need in the area, because it represents the most promising method



for integrating efforts across fields of interest, ensuring the soundness and methodological rigor of research, and maximizing the efficiency of efforts to results. While the Class I and Class II studies provide a substantial, organized data base, an active program of analyzing new data to revise and refine estimates of resource kind, density and distribution is essential. Through an ongoing program of evaluating the results from new surveys or other data recovery programs, the initial estimates generated herein may be improved resulting in enhanced planning capabilities. For example, results of future surveys in highland chaparral areas within or near the Class II study area may be used to draw sample transects post hoc which, when added to the existing sample and reanalyzed in similar modes, might provide more powerful estimates of density and site type diversity within a substratum for which little useful data could be generated from the initial inventory. While there are methodological problems to overcome, much of the value of the Class II (and Class I) exercises are in their potential as bases from which to expand upon in future work, rather than as static, discrete, finalized studies.

The major recommendation to be made, then, is that through an active program of analysis and synthesis: the use of existing data be maximized; regional issues be addressed wherever possible; the resources themselves be managed in an areal context as known or estimated populations; and that the various interests, values and concerns for cultural resources be evaluated in as systematic a context as possible. An output of this program might be an annual review of research and other activities affecting the resource base, revision of estimates of resource kind, density, and quality, review of research interests and directions, and an updated listing of source materials which may be useful to the various interests attached to the resources. Much of this effort may be accomplished through established institutional agency, and individually sponsored programs in the region. The regional clearinghouse at San Diego State University produces annual reviews of new projects undertaken, with other abstracts available from the County of San Diego. Cleveland National Forest and Anza Borrego Desert State Park have generated planning and impacts management studies in adjacent culturally and environmentally related areas that may be used to reanalyze and refine estimates of resource kind and distribution; and they may be willing to pool efforts towards a review of federally managed cultural resources. Collections of artifactual and ethnographic materials are listed in the Class I prepared by Wirth Associates, but detailed analysis or descriptive information is lacking. Private individual collections need to be identified and documented. The concerns of Native Americans towards prehistoric and historic sites and features have not been extensively solicited or applied to research or planning options or needs in the area. As their concerns are as important for management as any explored here,



and should have some direct bearing on the propriety of future data collection, programs to evaluate their recommendations should be developed and integrated with other aspects mentioned above.

These considerations are included within a section on research design rather than as a separate management section to emphasize their generic relationship to any research efforts undertaken. Through both the antiquities permit and proposal solicitation processes, BLM has the ability to control and coordinate the kinds and levels of research conducted, but this requires a thorough and current understanding of sources, alternatives, and concerns to effectively implement.

The remainder of this section will address more concrete and technical archaeological research needs. The emphasis will be more generic than operationally specific for several reasons. First, the logical confirmation of hypotheses tends from specific statements of condition back to a more general theory which it is to substantiate; hence, lengthy and closely reasoned chains of argument are required. However, the generation of hypotheses most often moves in the opposite direction. If the goal of a regional research discussion is to identify applicable theoretical directions and issues, then the latter direction seems more appropriate. Second, specific hypothesis testing requires some grounding in empirical reality. Yet at this juncture, because of the limited data available for addressing specific questions, the practicality of "testable" implications cannot be fully evaluated. Owing to these constraints, a choice of either a limited, detailed discussion of a few topics or a more general discussion of a wider range of issues had to be made. As this discussion is to serve as an overview to regional research, a more comprehensive outline will be presented.

### Research Priorities

As argued, a research design is a structure to direct means to specific goals. The selection of these goals, the perception of the propriety and priority of various topics is in part a systematic and logical process, but is not solely grounded in normative science. To a significant degree, these decisions result from the internal characteristics and external constraints upon individuals within a discipline (ethno-science), such as new discoveries, more or less monies available, "changing of the (theoretical) guard," or predefinition of the area of study and types of data recoverable due to agency or contractual requirements. To provide guidelines for future theoretical and methodological priorities that any given projects should address, three general recommendations are made.

These recommendations are selected after review of published reports, site records, and other data while attempting



to conduct the regional inventory and overview, and reflect major problems encountered with setting temporal, cultural, and functional correspondences or identities for the systematic sample data. While they are, in part, products of attempting a comprehensive regional overview from a single analysis, they were also indicative of the lack of theoretically and analytically substantive research produced in the area. This is argued to be primarily a function of the lack of a regional perspective. But it is also due to the preponderance of surveys directed toward simply finding and recording sites which are limited in scope. The recommended priorities are:

1. A shift in the overall interpretive focus from particularistic, normative culture-historical paradigms to more universal, behaviorally oriented systemic modeling of cultural structures and processes.
2. Refinement in the scaling of cultural, chronological, and functional identities or sequences from artifactual component or assemblage variability to allow more quantitative analysis to be applied. If artifactual and assemblage type classifications or occupational phase divisions are to be analytically or theoretically useful, there must be an experimentally verifiable basis for the divisions.
3. Increased emphasis upon cumulative, regional analytic techniques and requirements for the selection, recovery, and analysis of data samples so that (a) the individual projects can address ongoing regional problems, and (b) the cultural, functional, or temporal identities and sequences proposed receive broader testing for confirmation.

These recommendations are broad-based and general, and are intended as goals to pursue. The first should be seen as a development of theory from a descriptive to an explanatory emphasis which has popularly, but also logically, evolved within the discipline. The other two are appeals for establishing a more rigorous and demonstrable basis from which to propose or test ideas. Some specific examples should serve to demonstrate the propriety and relevance of these changes.

The initial phase of regional research is often exploratory, abstracting archaeological cultures across broad temporal and regional divisions as qualitatively defined identity sets of features and artifacts. Studies exemplifying this phase locally include Meighan (1959), Rogers (1939, 1945, 1966), True (1966, 1970), and Wallace (1958, 1962). All were set in a particularistic culture-historical paradigm and produced the basic outline of prehistoric cultural sequences, material culture inventories, and inferences concerning



adaptation. This phase still constitutes the most prevalent theoretical framework in use locally. It is interesting to note that within the brief but comprehensive prehistoric summary in the Class I document (Wirth Associates, 1978), substantive references after 1970 are rare, while the majority of sites have been recorded after that date. Although the level of activity has increased dramatically, few significant refinements to the existing sequences have emerged. While considerable detail remains to be explicated for each of the cultures or phases recognized, which may legitimately absorb interest and effort, the present lack of theoretical direction and coordination of effort has produced more archaeologists and sites than archaeology.

This initial phase of research delineated three major cultural traditions for the area: the San Dieguito, an early band level big game hunting tradition loosely defined from desert and coastal lithic industries; both coastal and desert variants of the Millingstone tradition; and the late prehistoric and historic groups who occupied all areas of the region, and who are most commonly addressed in archaeological work.

The major unresolved theoretical issue relevant to the area for San Dieguito and Early Millingstone tradition studies has been the extent of effects from postulated climatic changes to subsistence practices and range of occupation. These changes are inferred from fluctuations in sea level and Great Basin climatic sequences but, despite some limited local analysis, have not been tried to specific conditions in the area.

There is little disagreement that climatic/environmental conditions during the Paleo-Indian Horizons prior to 10,000 to 12,000 B.P. were radically different from those of the present. The climate was cooler and water more abundant; areas which are now arid and semi-arid environs contained extensive woodlands and open marshes with large lakes and interconnecting rivers. Within this context, the inhabitants have most often been perceived as big game hunters organized into small bands to facilitate the high degree of mobility so necessary for subsistence strategies dependence upon migratory resources (cf. Rogers, 1974; Davis, 1974). Environmental reconstructions for the subsequent 5,000 to 8,000 years are subject to interpretation, however. According to Mehringer (1979), with the exception of a few "mini-pluvials," climatic conditions have changed little from those of the present, whereas Antevs (1952) proposes an Altithermal period of harsh, arid conditions prior to the Medithermal -- essentially a climate like that of the present starting about 3,000 B.P.

The implications these two alternative schemes have for long-term prehistoric change are enormous, since cultural



systems would be expected to adapt and evolve differently under each. Under Altithermal conditions of low productivity and low stability, carrying capacity -- the maximum size of a population which can be maintained indefinitely within an area (Zubrow, 1975) -- would decrease to the point where equilibrium would be reestablished between available energy and population. Subsistence strategies would probably become highly generalized and flexible since more alternatives would be necessary in the event of individual resource failures. Archaeologically, the effects of such drastic, and presumably devastating, environmental change would be reflected in the overall density of sites, site type frequency composition (i.e., functional differentiation), locational distribution, and techno-economic artifact assemblages. Of these, the first is most often presented as evidence of the existence of an Altithermal period.

If an Altithermal did occur causing a significant depletion of the resource base, then carrying capacity will decrease and subsistence strategies will become more generalized. The implications are:

- (1) a lower site density, with few sites occupied for extensive durations by large numbers of individuals;
- (2) decreased site type differentiation, with fewer specialized extractive site types and a higher ratio of habitation to extractive site types; and (3) increased inter- and intra-site assemblage homogeneity.

If, conversely, a rather less drastic change in climate occurred, and carrying capacity under a given subsistence strategy was essentially unchanged, a rationale for the lack of occupation of the area by two major traditions (Late San Dieguito, Pauma/Amargosa) would be necessary. This might include a reliance upon areas where concentrated densities of game or other mass collectable proteins occurred such as pluvial lakes, coastal lagoons, or major river valleys, and a limited foraging emphasis upon vegetal resources as food sources. The latter would be difficult to posit for the Millingstone tradition as presently understood.

Underlying this entire question is a significant likelihood of sample error, such that sites representing these phases of occupation may be under-recorded or have gone unrecognized. The locales with the greatest number of reported early sites in the study region, Table and Volcanic Mountains northeast of Jacumba, are problematic in that they contain geologic resources of probable long-term importance. As Gould (1978) has demonstrated, bands adapted to marginal or harsh environments may regularly exploit specific geologic resources remote to their base territories.

Paleo environmental reconstruction is a central theoretical concern that should be emphasized in future research, especially where an earlier component of occupation



is encountered. Multi-disciplinary techniques and expertise will be needed, including geomorphological and palynological studies. A broad regional focus should be used that includes mountain summit and desert playa lake events and sequences.

The late prehistoric tradition is mainly representative of the prehistory of the area. Two major foci of traditional theoretical interest may be identified: analogic interpretation of the archaeological phenomena from ethnographic and ethnohistoric data; and cultural diffusion or immigration from other areas such as the Colorado River and Lake Cahuilla areas to the east.

The first emphasis represents the primary interpretive theory for local archaeology; examples include differentiating trait complexes and associating them with linguistic divisions (True, 1966), defining lineage-based resource procurement territories from informant data applied to survey results (True et al., 1974), and analyses of settlement and subsistence practices from ethnobotanic studies and existing environmental configurations. Restated as formal hypotheses, the following would result, for example.

If the southern county was populated by Yuman speakers and the northern Shoshonean, then a greater incidence and earlier acceptance of desert and Colorado River cultural traits should be noted for groups in the southern county, who are ethnically tied.

If ceramic types and especially design elements are traditional -- passed from mother to daughter (cf. Rogers, 1936; May, 1978) -- then the extent of marriage exchange, and hence regional ethnicity, may be traced from variability in ceramic type and design elements noted at habitation areas.

Ceramic type variability in the area may be the result of cultural traditions in manufacture and properties of the local source clays (May, 1978). The distributions of ceramic types observed in an archaeological context may be the result of stylistic traditions, dates of occupation and selection for types more suited to particular uses (e.g. cooking, storage). So the explanation of type distributions will require more than positing culture areas or time frames, but will also require some control over the activities presumed to be associated with ceramic use. As a functional parameter must be approximated, it is proposed that type variability at limited activity sites such as storage caches will be more restricted and consistent over an area and through time, due to selection for use characteristics that remain fairly constant. Vessels used in heating and cooking will also be more restricted by functional requirements. Testing of this hypothesized relationship may demonstrate that certain types (or shapes) are in consistent physical use for specific tasks, and allow



estimation of the contribution of properties of clays or tempers to overall type variability.

The second emphasis is upon diffusion and in-migration as the prime mover for culture change (given no major environmental changes). This process is variably used to explain the development of the Late Prehistoric culture from the resident La Jollan, the introduction of ceramics, and as yet undocumented though widely anticipated incipient agriculture, or settlement patterning changes during the Late Prehistoric. While there is ample evidence of new cultural traits (e.g. changes in funerary practices) and technology (e.g. ceramics) that may be associated with groups in the east, counter hypotheses of internal development or evolutionary response have not been explored in any detail, nor have likely explanatory mechanisms for these changes been noted.

The introduction of ceramics may serve as an example. As one of the most frequently occurring artifact classes observed throughout the McCain Valley Study Area, ceramics afford researchers the ability to study a large number of problems ranging from basic chronology to culture change and processes. Close to forty percent of all sites exhibited ceramics, and if certain site types are excluded where ceramics would not normally be expected -- most notably roasting pits -- then ceramics were present in seventy percent of the site sample. The introduction and use of ceramics must therefore have had a significant impact upon the prehistoric cultures.

The ceramics can be divided into two basic ware groupings: Tizon Brown Wares and Desert Buff Wares. The former are considered indigenous to the Peninsular Range area and constructed from residual clay sources, whereas the latter are from the desert valleys east to the Colorado River, made with wash, river, and lake bed sedimentary clay deposits. Both are present within the study area represented by three ware/type classes: brown wares with coarse inclusions, buff wares with moderately coarse inclusions, and buff wares with fine, sandy inclusions, probably representing mountain, desert transition, and desert clay source areas. The division of each ware into finer series and type variants is presently a subject of considerably controversy, and dependent upon the explanatory goals and typological methods used by the different researchers. While it is impossible at this point to evaluate the validity of any of the "competing" typologies, each has potential utility in the analysis of ceramics and should be tested as research in the area progresses. Thus, without negating their utility, what is suggested here is that researchers be more explicit in defining what it is they are attempting to answer in the ceramic analysis such that problem-oriented typologies are formulated and used more frequently.

There is, however, one potential research topic which can be addressed regardless of the typology used, and it concerns



the implications of the introduction of ceramics. As a major technological innovation which diffused into the study area from the Colorado River area, some subsistence change must have resulted. The relative abundance of ceramics indicates that they did not just simply replace functionally equivalent items made by existing technologies, e.g. baskets, wooden plates, etc., but were adopted for some reason. According to Earle (1980:23), a new technological item is accepted by a group for two reasons: (1) it may increase the efficiency of procuring a resource, resulting in decreased energy output per yield, and an increased importance of the resource in the subsistence economy; and (2) it may effect an increase in the maximum yield of a resource and thus permit its intensification as a means to increase production. With increased procurement efficiency and production, surplus may have resulted, thus affecting carrying capacity; the same region with the same resource would then be able to maintain a large population.

Another possible effect of the introduction and use of ceramics may have been improved storage capabilities. Food storage is an evolutionary response that provides a compromise between spatial and temporal incongruities in resource availability (Schalk, 1977:229). Resources do not have to be exploited in proportion to their natural availability and immediately processed and consumed, but may be stockpiled and transported for later use as needed. This strategy not only improves subsistence stability, but also results in increased socio-economic differentiation, i.e. a transition from multifunctional role structure to more specialized ones.

One measure of changes in differentiation is the number of different kinds of activity sites. The differentiation of activities, were it occurring, might be reflected in the arrangement of activities on sites. The more kinds of sites with distinctive activities, the more differentiated is the total activity process . . . The proposition that activities are becoming more differentiated on an intersite basis will be accepted if the total area of limited-activity sites increases at its most rapid rate and reaches a maximum during the transition; and if the coefficient of variability analysis indicates there is a tendency for more types of limited activity sites to be present during this period than during any other (Plog, 1974:77).

Since it is a safe assumption that late prehistoric groups inhabited the study area prior to the introduction of ceramics, comparative data should be available to test the following hypothesis. Obviously, controlled excavation of the larger, stratified sites such as villages and temporary camps will provide the bulk of data, but attempts should also be made to



date the smaller, limited-activity site types as they are an integral part for successful operationalization as noted by Plog above.

Hypothesis: The introduction and subsequent use of ceramics is a sufficient condition for either an increase in population or an increase in differentiation.

Implications: (1) Increased site density as measured by the number of sites per square mile and mean distance between sites (especially as reflected in the density of habitation sites); (2) An increase in the number and number of kinds of limited-activity, or extractive, sites; (3) Increased intersite assemblage differentiation; and (4) An increase in the intrasite spatial variability of artifacts representing special, discrete activities.

If a ceramic technology was generally advantageous to the subsistence economy, its introduction should accompany changes to population density, economic organization and specialization, or habitation and extractive/processing site spatial relationships. If storage capabilities were enhanced qualitatively, then an increase in the utilization of marginal areas and greater investment on specifically targeted, storageable vegetal food sources may be posited. If storage capabilities were only quantitatively raised as the manufacturing costs in labor per given unit of storage were lowered, then greater volumes of staples such as acorns would be available. These factors are suggestive of increased population density and range after the introduction of ceramics, but require a more structural analysis of the economy, especially such factors as seasonality and scheduling, group vs. individual labor investments, mobility vs. sedentarism, to evaluate the technological effects upon carrying capacity. Little is known of a local preceramic Late Prehistoric tradition that is inferred from Meighan's (1954) work in the San Luis Rey River drainage, so a comparative analysis is not readily available and will require considerable new study. Finer chronological control within the ceramic phase would allow some development of models of the effects from this technological adaptation, but the overall goal should be the evaluation of external diffusionary and internal evolutionary hypotheses for culture change.

A transitional step has been to take the inferential products of the culture-historical school and transform them into hypotheses with more specific test implications. An ongoing program of research within the Table Mountain area may serve as an example (May, 1976). Its apparent focus is upon testing hypothesized effects of "cultural preference" in settlement and subsistence practices diachronically by analyzing changes in habitation and specialized activity sites through their locations and associated micro-environments. In keeping with an interpretive emphasis, correlations of



archaeological sequences and variability in site locational distributions are explained as the result of diffusion of new cognitive (emic) models of settlement introduced from outside the area. The theoretical implication here is finality, however, and it is not recognized that data patterning is assumed to be an indication of the effects of one or a conjunction of variables that are somehow measurably related, and that internal evolutionary change must be refuted before exotic cognitive traditions can be accepted as explanation.

Two more integrative models of cultural history in relation to economic and ecological adaptations have been advanced by Kowta (1969) and Wilke (1973). Kowta's work is a classic example of a transition from particularistic and normative explanation to a more modern focus on processes of adaptation and evolutionary development. He posits that the long-standing tradition of exploitation of agave and yucca for food and fiber particularly characterizes the site distribution of the inland Milling Stone Horizon, and may also characterize the earlier San Dieguito. Material implications for sub-assemblages for this subsistence component are inferred from ethnographic descriptions to include manos and metates or slick and anvil surfaces for pounding, blades and core based scrapers with high edge angles for fleshing (1969:55) and, parenthetically, earth ovens or roasting pits. Two major test implications are derived: the distribution of Millingstone Horizon sites should correspond to the range of agave-yucca during the Altithermal; and inland sites during this period should exhibit higher frequencies of artifacts belonging to the inferred agave/yucca exploitation sub-assemblage than coastal sites. Climatic change, then, determines the range and density of sites through its effects upon a critical intervening variable (agave and yucca), which was a major component of subsistence and a basic raw material for utilitarian items.

This scheme has several interesting consequences applicable to the region, and it is surprising it has not been addressed locally (although it may be seriously in error). The study area encompasses a sharply transitional physiographic and climatic area. Major differences in the distribution of genera would have been expected within its three major zones (summit, upland plateau, desert valley). San Dieguito sites are reported for the eastern periphery, but so far no evidence for substantial Millingstone occupations has been shown. While the importance of agave or yucca to San Dieguito is in question, if demonstrated, Kowta proposes that they may have transmitted the technology to the coastal zone across areas such as this one.

If the San Dieguito were oriented towards hunting and foraging for vegetal resources as small mobile bands then their exploitation of agave/yucca would have been



on an encounter basis and of limited importance in relation to the total subsistence procurement activities. Their use of the plant for food or fiber would have been individually executed under an opportunistic strategy as a subsidiary resource. Hence, we might expect that its availability, in terms of seasonality and accessibility, would play only a minor role in terms of site location or number of activity-specific sites generated. This is not to diminish its importance to the economy, but rather its lack of importance to settlement location or number of sites produced and low archaeological representation.

It has been argued in general that a possible drying and warming of climate had a major effect upon cultural evolution and archaeological site density in the region. One effect is to increase the necessary area in which to procure subsistence resources. Two responses are likely: a decrease in population density and increase in the types of food resources and areas utilized, and technological and societal changes to increase and maximize the output from specific micro-environments. These processes would explain the near-abandonment of marginal arid zones such as the study area by hunter-foragers, the rise of more sedentary and cooperative groups around rich micro-environments such as the lagoon-oriented La Jollas, and a possible transitional or concurrent exploitation of inland valleys such as the Pauma complex.

For groups of the Millingstone Horizon, agave should, as Kowta suggests, increase in importance in the subsistence economy. However, its remoteness from base environments should condition the intensity of exploitation and methods under which it would be procured. Rather than a foraging encounter strategy, specific forays to its habitat locations would be necessary, by individuals or parties, with more focused collection and processing activities. Hence, we might expect to see more coherent sub-assemblages related specifically to agave procurement and processing, and small support base camps strategically positioned in terms of agave distributions. The frequency of these sites should be a function of the distance to base environments (cf. Corum, Findlow and White, 1977).

For the study area during the Millingstone period, especially if more arid, occupation should tend to be focused upon collection of specific, targeted resources with the overall level of activity a function of the distance to viable support environments such as the coastal valleys, mountains or large riverine or lake systems. Agave procurement should be an archaeologically recognizable activity from which to estimate the level of use of the area. For this period, given the distance to the known extent of the Millingstone Horizon locally, the level of use would be low. However, some occupation is predicted, and in contrast to the San Dieguito, it



should be represented by specific coherent resource procurement and processing features with support base camps positioned advantageously both to the habitat of the targeted resource and the activity-specific extraction or processing sites.

The study results demonstrate the importance of agave to the Late Prehistoric adaptation, but diachronic analysis is not possible for the reasons outlined in the text. Inter-site spatial analysis is also not possible with the survey sample data owing to its systematic transect format. Two large reasonably comprehensive block surveys have been completed at Canebrake Wash and Table Mountain, and could be used for inter-site spatial analysis. Given that the Late Prehistoric agave exploitation was a major and visible component of subsistence in the desert valleys of the study area, identifiable features and sub-assemblages related to agave processing may be used as a control to investigate the development of the technology and test hypothesis concerning the increasing specialization in its extraction and processing. Most of the numerous roasting pit features throughout the valleys and canyons can be radiometrically dated, and an areal random sampling would provide estimates of the age and rates of growth of the tradition. Palynological analysis of stratigraphically or radiometrically controlled samples may also provide regional densities for the agave-yucca genera through time.

Kowta's hypothesized scheme suggests following the development of a major component of subsistence (which has undoubted antiquity) and its spatial temporal distribution to estimate human population range and density. The role of agave in the evolutionary development of California gathering subsistence technology has probably received less attention than it deserves. It is not suggested that this be the primary focus of research in the area, but rather that it is germane, as agave was clearly important through the Late Prehistoric, and deserves further study. It is emphasized that such study should be pursued in relation to other aspects of the subsistence procurement system.

Wilke (1973) has proposed a separate model of resource distribution as a major independent episode, focusing upon the response of interior groups during the Late Prehistoric to the last filling of the Salton Basin. He argues that the lake shore was such a substantial new biota of sufficient duration as to have provided for specialized, increasingly sedentary groups to expand around its periphery. With eventual desiccation, the population that had been dependent upon lacustrine resources out-migrated to surrounding areas, such as the study area, and adapted food production techniques to the Salton Basin. This is intended to explain the apparent increase in the density of populations (sites) during later phases of the Late Prehistoric within the interior of Southern California, and an alternative to simple diffusion as an explanation for agricultural development. Weide (1974) has



critiqued the assumptions of this scheme, especially the extended viability of the lake as a subsistence base and development of specialized settlement and subsistence around it.

This controversy provides a potential focus for research as the McCain area is hypothesized to have been affected following desiccation, and the majority of sites recorded are of the ceramic period. A traditional culture-historical approach would approximate the relative density of pre- and post-lake stand sites and seek differences in artifact and type and frequency that may represent cultural in-migration. This traditional approach would provide an impetus to developing finer cultural sequencing, and greater attention to inter-site or inter-assemblage variability. But lacking are theoretical and causal propositions to explain how the lake stand would have affected the surrounding populations, what adaptive systems would be expected to change, or how to distinguish changes that may be due to inertial cultural dynamics that would have occurred with or without the lake stand events.

The crux of the problem is the pre-lake stand adaptation to the area for which there is little specific data. Following the model discussed previously, an internal evolution of adaptation to agave/acorn subsistence is wholly defensible as a hypothesis. Therefore, if a regular adaptation to mountain summit and desert valley were already in effect, how would the lake stand alter subsistence strategies in the study area? The lake filling is not a function of general climatic change, but a variable catastrophic episode related to movements of the Colorado River course. Hence, its effect upon the surrounding environment may have been minimal. Within the episode, an increase in the resource base around the lake margin in plants such as mesquite, prunus, and tule, may be posited along with increases in fish, fowl and terrestrial fauna, however, these new potential food sources may have increased the available biota for subsistence, but also may have been in conflict with existing schedules and labor requirements for more secure resources.

If the resources created major conflicts in the scheduling of other subsistence products in the previous environment, the response of groups in the study area to the new resource base may have been only occasional and opportunistic exploitation without the movement of large groups or seasonal habitation. Therefore, the sites generated from exploitation of the lakeshore by endemic groups would consist of small group camps and vegetal extraction or hunting sites. If the resources did not conflict, a more stable migratory pattern by larger groups may have occurred, changing the pattern of the regular seasonal round and resources relied upon in the study area. A third alternative follows from a pattern



of conflicting resource schedules but allows growth of a semi-sedentary group on the shoreline through active, regular trade with the more interior oriented groups.

If a stable population developed along the lakeshore, and exchange became an increasingly important component of the economy, then greater investments in storeageable foodstuffs such as acorns or pinyon nuts may have been stimulated. The intensity of exploitation in the upland summits should have increased, and as this requires organized group labor, more nucleated and sedentary occupation may have been practiced. Trade products such as fish and large fowl, or desert ceramic wares, should accompany this change in settlement practice. If, however, a seasonal use of lakeshore and summit prevailed, a less intensive and more dispersed group pattern to summit residence and acorn, pine, grasses exploitation is anticipated, with lower levels of exotic items noted.

The intervening upper desert valleys of the study area may also have experienced differential occupations for these competing models. If a regular migratory pattern was followed from lakeshore to summit, a decrease in the sedentarism of seasonal occupation should be noted in areas such as Vallecitos or Canebrake Wash. If, however, a resident lakeshore group is posited, stable or increased sedentarism may be expected. The positioning of habitation sites may shift eastwards under a trade model to facilitate contact, but this increases the problems of storage and movement of the relatively high bulk acorn staple, which may have been met by an increased number of storage caches or granaries along the western edge of the valleys. Before and after the lake stand, semi-sedentary occupation of the desert valleys should have been focused closer to the mountain summits to lessen the logistical costs of movement of the acorn staple to the winter residence areas.

Potential research avenues include obsidian hydration and analysis of ceramic type frequency variability to scale chronological sequences in relation to the nominal dates for Lake Cahuilla.

During the time Lake Cahuilla was above the 130-foot level, the most local source of obsidian -- Obsidian Butte -- would have been submerged. As discussed in Section 3.5, the age frequencies for samples should reflect this period of inundation as breaks in the age sequence. Also postulated are three effects to lithic source materials during inundation: (1) an increase in the use of other fine grained materials; (2) use of obsidian from other more remote sources; (3) reuse of discarded obsidian. These implications may serve to correlate occupations to the lake stand episodes regionally. Alternatively, a decrease in the residual frequencies of imported Colorado Buff wares and increase in Salton Buff, which is believed endemic to the lakeshore area, should accompany



the lakestand event. Emphasis should also be placed upon analysis of inter-site regional locational patterns, and inter-assemblage variability to test for specific changes in subsistence sub-systems. If increased populations are to be supported, changes in food procurement strategies and scheduling, extraction rates, level of storage, and increased use of more marginal zones or a transition to an agricultural economy (agriculture) may have occurred.

The point emphasized is that from rather innocent and not terribly complex hypotheses, the competency of current theory or practice is outstripped by the logical implications it generates. That more sites post-date the lake desiccation does not really answer the question of the response of groups to its resource potential, nor demonstrate population readjustments. The issues that these questions raise focus upon subsistence adaptation technologies and strategies, which need to be operationally defined and tested through ongoing analysis.

Some of these needs may be met through application of theory covering the behavior of hunter-gatherers in subsistence activities and settlement positioning derived from ethnographic and ethno-archaeological studies. Recent works by Jochim (1976), Lee and Devore (1968), Yellen (1977), Binford (1978, 1980) exemplify this developing emphasis by seeking " . . . factors that condition or 'cause' different patterns of inter-site variability in the archaeological record" (Binford, 1980:5) rather than seeking variability and inferring causes. These recent studies are oriented toward developing general models of hunter-gatherer subsistence and settlement practices as adaptations to the structure and spatial-temporal "incongruities" within environments, with specific emphasis upon depositional implications that may comprise the archaeological context. What is interesting (and encouraging) is that models derived from observing modern hunter-gatherers should provide so many generalizations relevant to the environmental and cultural variability within the study area.

In the preceding discussion, a series of potential research questions and related hypotheses for the McCain Valley Study Area have been presented. Most are interrelated in some manner, and focus on general issues of prehistoric change as reflected in the archaeological record for a broad range of site types and artifact classes. This orientation or bias is necessary in one sense given the paucity of basic culture historical and chronological information, without which specificity will always be lacking. But also, such an orientation demonstrates that substantive research can be conducted in the absence of a refined culture historical scheme. This is not to say that culture historical questions are unimportant or irrelevant, for quite to the contrary, a system of priorities should be established requiring chronological definition and formulation of culture tradition/horizon and phase syntheses.



For most of the hypotheses, a regional data base -- one drawn from a sample of sites -- will be necessary for testing their implications. However, as it is anticipated that future impact mitigation programs will probably deal with individual sites or subregions, additional research questions will have to be generated on a project-by-project basis. Thus, should the particular site be a lithic scatter, one might be immediately concerned with proposing research hypotheses which would attempt to determine the antiquity of the resource, its culture historical affiliations, and the type of activities represented or function. Potential research problems which may be investigated at a large temporary camp would be expanded to include the nature of occupation and duration thereof, size of the habitation population and social organization, range of subsistence and maintenance activity represented, etc. But whatever the particular research restrictions, requirements, potentialities, and biases, an attempt should be made to address questions of broader, regional nature.

To summarize, a major recommendation for new research is to shift the theoretical interpretive emphasis from normative culture history to more systemic processual modeling of hunter-gatherer behavior and evolutionary development. This is recommended in reaction to the inherent impotency of current practices for increasing understanding of the sequences, and in recognition of the limitations imposed by site condition, type, and sources of data for analysis, which will probably remain restricted to surface analysis. There has accumulated a significant body of surface survey data that has not resolved the questions posed so far. A shift in the interpretative structure and emphasis should conserve an information base that is dissipating rapidly, and kindle new interest in that information.



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